

40 Rock ©

POPULAR Computing WEEKLY

10-16 January 1985

It's the best selling weekly

Vol 4 No 2

MUSIC SPECIAL FEATURE ISSUE:

All you need to know about music and micros Which software to buy.

Acorn's Music 500 reviewed
Yamaha's synth with an MSX micro thrown in.

Spectrum sound sampler.

PLUS:
Thomas Dolby
Competition

SIEL
keyboards
worth
£2,000
to win!



CBM & Atari launch 8 new micros

COMMODORE and Atari have, between them, launched eight new computers at the Winter Consumer Electronics Show, held in Las Vegas earlier this week.

Commodore showed two new micros, the C128 PC and the Commodore LCD Portable. Atari launched four XE 8-bit machines and two ST models using the advanced 32/16 bit 68000 chip.

The show also presented a 'new' Atari, under the control of ex-Commodore chief Jack Tramiel, which is committed to "becoming by far the lowest priced manufacturers".

The Commodore C128 has 128K Ram and 48K Rom, runs Basic 7.0 and uses a 6502 compatible processor, the 8502. The machine operates in three modes: 128K mode, of-

fering 128K Ram to Basic in two 64K switchable blocks; C64 mode, compatible with all C64 software; and CP/M mode using an in-built Z80 second processor to provide CP/M compatibility. Display is 80 x 25 characters and Ram is expandable up to 512K. The machine is planned to be available in the US in March/April at a price under \$300 (around £265). Although the C128 does not have a built-in disc drive, Commodore announced the 1571 disc unit for the machine, 5 1/4 inch 0.5M (360K formatted) capacity double-sided drive which itself includes a 6502 processor, 2K Ram and 32K Rom. The C128 also makes use of a new Commodore 'mouse' controller device.

continued on page 5



INSIDE

»

SOUNDS GREAT? MUSIC ON C64 AND BBC



S.I.M.

The greatest animated graphic adventure yet, with over
70 screens to discover and conquer.
For the BBC and ELECTRON



Play with Fire!
The best shoot 'em up, ever written for the BBC.



C.S.M. (Consolidated Software Marketing)
Suite 40, Strand House, Green Way Road, Brentford, Middx. TW8 7EX. Tel 01-560 4191

>Presents...

Eight new machines at January's Consumer Electronics show in Las Vegas. Ye Gods!

If that doesn't shake things up a bit then nothing will.

By far the most interesting of the new machines are Atari's two ST (Sam Tramiel?) models. The use the same 68000 chip as Apple's Macintosh offering very similar features, at bargain prices: \$399 for the 128K version and \$599 for the 512K machine.

Initial reaction from US software houses was enthusiastic although most will hang fire to see if Tramiel can actually produce the machines in April as he claims.

The other interesting micro is Commodore's C128 which is Commodore 64 compatible, yet offers CP/M, all for under \$300.

Being C64 compatible, the machine is bound to extend the life of Commodore's existing C64 model and the C128 launch leaves the company's Plus/4 and C16 models rather out on a limb.

Very little new software for either the C16 or Plus/4 was shown at CES and even Commodore admitted that the machines will have to be "repositioned in the market".

Whether they will be scrapped or their price will be dropped remains to be seen. It is interesting too that Commodore has not shown either of its planned up-market micros, the IBM compatible or the 88000 Amiga, the latter obviously a competitor for Atari's new ST range.

Whatever, the former, apparently, will only be launched in Europe, but no date has been given. With the launch of Atari's ST machines and Commodore's C128, the future now looks very gloomy indeed for the Sinclair QL in the US.

News > Prism problems > Atmos upgrade to IQ164

Star Game > Bertie the caterpillar features in this horrifying tale of *Pupae Peril*

Streetlife > Computer music band Mainframe get into trouble with the Noise of Art

Hardware > Acorn's music add-on for the BBC - Music 500 > Jeremy Vine looks at Yamaha's MSX with a difference - the CX5ME > Chris Jenkins samples Datel's Spectrum digital sound sampler

Software > Gary Herman picks the best music software for your micro

Competition > Win £2,000 worth of Siel music keyboards in Thomas Dolby's Micro Music Competition

Software > Acornsoft's Logo > Technician Ted > Manic Miner on Amstrad

Commodore 64 > Machine-code music by Simon Wallace

The QL page > A simple effective sketch-pad program for the QL by Andrew Pritchard

BBC & Electron > Turn your BBC into a polyphonic music machine

Best of the Rest > Letters 6 > Dragon 33 > Open Forum 35 > Arcade Avenue 35 > Baud Walk 36 > Adventure Corner 38 > Readers' Chart, Top 10, Diary 46 > New Releases, This Week 47 > Ziggurat, Puzzle, Hackers 50

>Futures...

Dicey business on Amstrad CPC464... graphs on C64... making sense of Roman numbers on Spectrum

5

10

12

17

20

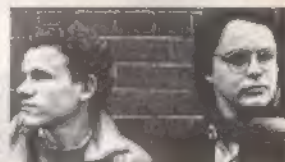
23

24

26

29

30



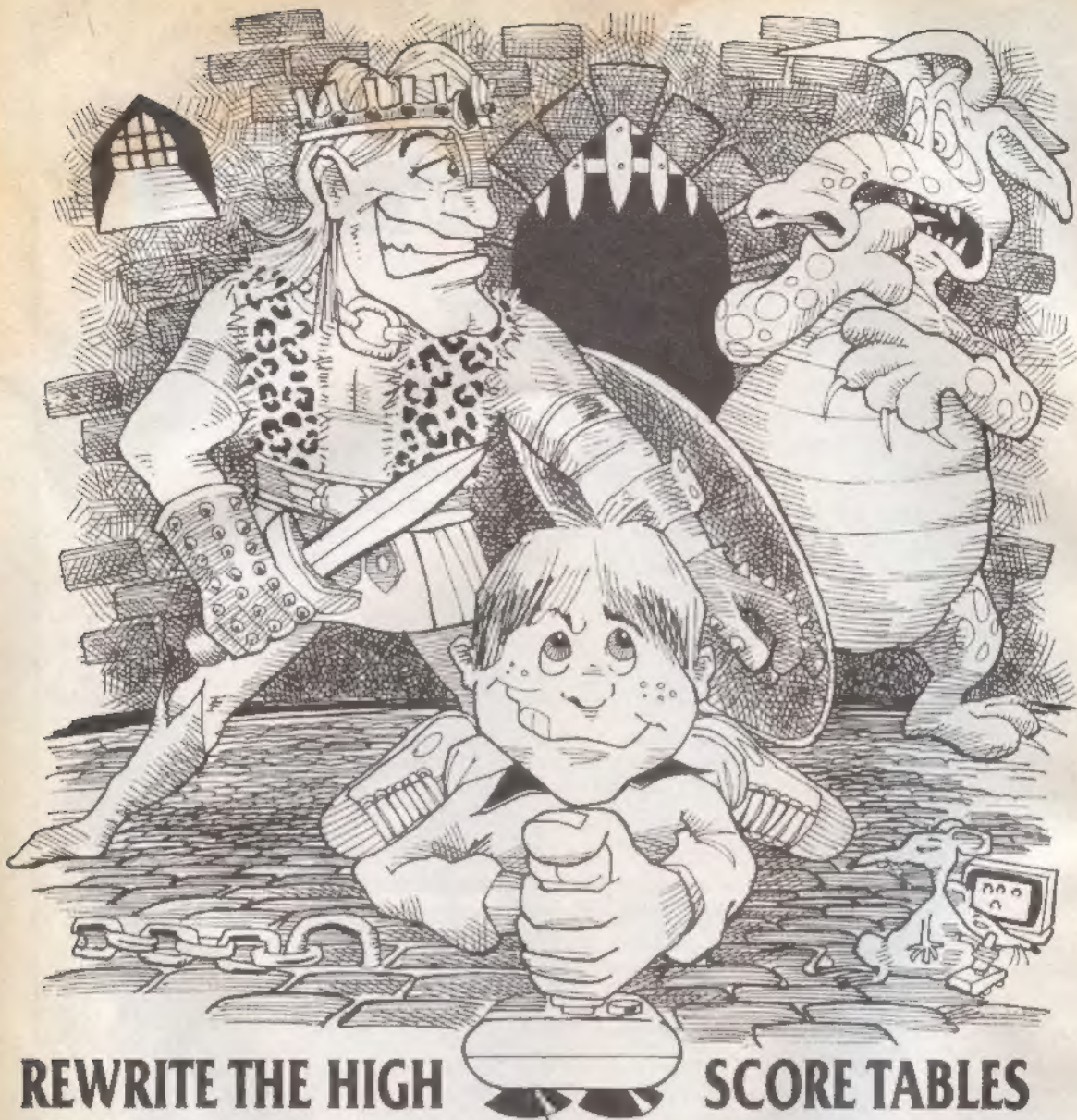
Editor David Kelly News editor Christina Erskine Features editor Graham Taylor Software editor John Cook Production editor Lynne Constable Editorial secretary Geraldine Smyth Advertisement manager David Lake Assistant advertisement manager Alastair Macintosh Advertisement executive Tom Watson Classified executive Diane Davis Advertising production Lucinda Lee Administration Theresa Lacy Managing editor Duncan Scot Publishing director Jenny Ireland. Published by Sunshine Publications Ltd, 12-13 Little Newport Street, London EC2H 7PP. Tel 01-437 4343 Telex 295275 Typeset by Publishers Reprographics Services Ltd, 4 Roger Street, London WC1. Printed by Greenaway Harrison, Sutton Road, Southend-on-sea, Essex. Distributed by S M Distribution, London SW9. Tel 01-274 8611, Telex 261643 © Sunshine Publications Ltd 1985.

ABC

56,052 copies sold every week
(Jan-June 1984 ABC)

How to submit articles Articles which are submitted for publication should not be more than 2000 words long. The articles, and any accompanying programs, should be original. It is breaking the law of copyright to copy programs out of other magazines and submit them here — so please do not be tempted. **Accuracy** Popular Computing Weekly cannot accept any responsibility for any errors in programs we publish, although we will always try our best to make sure programs work.

Computer Trade Association Magazine of the Year



REWRITE THE HIGH SCORE TABLES

With the Gunshot, you'll have all your enemies cowering in corners. 8-directional action and an all-in-one moulded stem allows accurate annihilation and strength to survive those all-night sessions. Dual fire buttons for fading fingers (and a rapid fire version when they're really coming thick and fast). And, if you break it (and we know you'll try) our 12 month guarantee will prove invaluable. The Gunshot plugs directly in to practically all popular home computers (ask about Vulcan interfaces for the BBC, Spectrum, Electron, C16, Plus 4). Only £8.95.

See the range of Vulcan joysticks and interfaces at your local stockist... we'll see you on the high score tables.



VULCAN
ELECTRONICS LTD
Joystick Genius

200 BRENT STREET HENDON NW4 1BH TEL: 01-203 6366

Oric plans DIY Stratos

ORIC'S new Stratos home computer, due for launch on the Continent within the next two months could be launched in the UK in the form of an up-grade kit for existing Oric Atmos owners.

According to Bruce Everiss, Tansoft's managing

"The up-grade will take the form of a 'goodies box', in which we will put the disc controller, joystick interfaces, the ULA which decodes the Atmos's extra 16K of Ram to give a 64K machine, the bank switches to enable the Rom sockets to be used, and



director, "We are thinking of bringing out an up-grade kit to convert the Atmos into the Stratos, or IQ 164, as we plan to call it in this country, rather like the up-grade that was offered to Oric 1 owners for the Atmos.

"I can envisage a hardware price war between the big companies in 1985, and bringing out the Stratos as an up-grade may be the most viable way to do it.

the Stratos's Basic cartridge. This could be available at the end of February."

Bruce stressed, however, that these plans were not definite. "If the market goes against our expectations, and remains orderly, then we will launch the Stratos as a new machine in the UK, probably under the name IQ 164."

No price has yet been indicated for the planned up-grade kit.

CBM and Atari machines

◀ continued from page 1

The company's second new machine is the LCD Portable. This uses another 6802 derivative, the 68C102 and has 32K Ram, 96K Rom and an 80 x 16 characters built-in liquid crystal display. The machine's 96K Rom includes built-in wordprocessor, spreadsheet file manager, notepad, monitor and terminal emulator software. No price has yet been fixed but US delivery is scheduled for March/April.

Atari previewed its fast ST range of 68000-based micros. Two machines are planned initially—the 130ST with 128K Ram and the 520 ST with 512K Ram. Both are very competitively priced—the 130ST is to cost \$399 (about £350) while the 520ST will cost \$599 (around £525). Both machines are scheduled for the end of April. The machines feature a 96K Rom, offering many of the advanced software features

of machines like Apple's Macintosh in the built-in Digital Research-developed TOS operating system.

Also included in the Rom, which is expandable with plug-in cartridges to 327K, are a calculator, clock, Basic language and some built-in applications software. The machine's display features 512 colours.

Atari showed a range of printers and 3½ inch disc drives to accompany the ST machines beginning at \$150 (£130). A 10M hard disc unit is also planned for under \$600 (£525).

As well as the ST machines Atari announced a range of four XE machines. These are a development from the company's existing 800XL 8-bit computer range and are fully software and peripheral compatible with the 800XL.

The XE machines are as follows: The 65XE is a repack-

US Gold offshoots launched

OCEAN and Centresoft are setting up two more joint companies to complement their existing US Gold, venture.

The companies, All-American Adventures and Famous Faces, will, like US Gold, publish exclusively American titles in this country.

"All future US Gold titles will be purely arcade-type games," explained Centresoft director Anne Brown.

Geoff Brown from Centresoft and David Ward of Ocean are currently in the US to buy rights to adventures for the All-American label, and games endorsed by celebrities for the Famous Faces label.

The first All-American Ad-

venture title to be released in this country will be *Ultima 3*, from Sierra, in early February. At the same time, *Conan the Barbarian*, the first of the Famous Faces range, will be launched.

US Gold's current *Indiana Jones* title was originally intended for the Famous Faces series.

Games under the two new labels will be priced, like US Gold products, between £9.95 and £14.95 and will appear first on the Commodore 64 and Atari machines. "Wherever possible, we will be converting to the Spectrum as well," Anne continued. "We are planning to have around 80 titles available by the end of 1985."

Prism hits financial trouble

MICRO distributor Prism has run into cashflow problems, causing it to try to renegotiate its credit terms with Sinclair Research.

Around 90% of Prism's turnover comes from distribution of Sinclair's hardware products, notably the Spectrum and Spectrum+. The company is blaming the pre-Christmas bludge in sales, poor sales of software and the closure of two magazines under ECC Publications, a Prism subsidiary, for its plight.

"Having been very buoyant for the first two years of its existence, that buoyancy has

aged 800XL with 64K Ram which will sell for under \$120 (£105). It has built-in Basic, 4-voice sound and a 256 colour display with 11 graphic modes.

The 65XEM is similar to the 65XE with 64K Ram and is designed as a 'music' computer. In its basic form it has no music keyboard but offers 8 sound channels.

The 65XEP is a portable version of the XE with a built-in 3½ inch disc drive and 5 inch monochrome monitor, again with 64K Ram.

Finally, Atari offers the 130XE, a version with 128K Ram. Like Commodore's C128, the Ram is organised in two 64K switchable banks.

now taken a puncture," said a spokeswoman for the company. "There is certainly a cashflow problem, but it's not an emergency."

Prism is hoping to extend credit terms with Sinclair from 30 days to 40-60 days. Its problems come at a difficult time for Sinclair which is planning a full stock-market listing within the next few months. However, it is unlikely that any financial problems at Prism would affect Sinclair's flotation.

Hackers hold convention in Hamburg

THREE hundred computer 'hacking' enthusiasts enjoyed a two-day orgy of hacking, information exchanging, and hack-related research in Hamburg, West Germany.

Around 30 computer terminals were in constant use at the Chaos Communication Congress, which held seminars on 'Laws for Hackers' among other topics.

Delegates came from as far away as New York to demonstrate how to tap into a US computer network.

The high point of the congress was an attempt to break into Citibank's central computer in Frankfurt. Sadly for the hackers, they were only able to make initial contact with the bank's computer network, but were unable to break into any of the files.

The weak spots

Recently, there has been much talk about 'hacking' and the extent to which hackers have probed into mainframes.

What I cannot understand is why 'hacking' has been dubbed as wrong - somehow a crime. Surely, the only way security on a system can be improved is by it being broken in in the first place. Hackers should in fact be thanked for helping to find the weaker spots in a system's security.

Of course, a successful computer hacker is a potential threat to the security of information on a system, but few (certainly of those that have received media attention) have attempted to alter, delete or sell information they have seen. Instead they have done the best possible thing - ie, alerted the company concerned of their weak security (plus the media, of course).

After all, if I was to have files containing personal information about myself and my finances, for example, I would expect them to have the best possible security. Wouldn't you?

M Harvey
Bradford-on-Avon
Wilts

Pascal support

Does anyone know how to make Hisoft's Pascal for the Spectrum support the Rotronics Wafadrive instead of the Microdrive?

J S Dowker
Department of Theoretical
Physics
The University
Manchester

Killing the value

Since I bought my Spectrum I have probably bought around £350 worth of software for it.

Yet, now, when I am trying to sell the machine no-one wants to know about my software for which I am trying to get around £100.

Potential purchasers were all only interested in buying just the computer - figuring

that they could pirate whatever software they wanted from their friends.

It is not just the software houses that are losing out as a result of piracy but anyone who buys software. Piracy is killing the resale value of any piece of software you buy.

D R Halliwell
4 Heatherdale Close
Oxton
Birkenhead
Merseyside

A poor deal

I've just bought Legend's long-awaited and much publicised game, *The Great Space Race*.

I was so astonished I fired up *Tasword* straight away to tell you about it. It is not at all as I expected. I feel I have got a poor deal for my £14.95 - getting something which appears on the screen like a £5.00 game in a flashy box.

A year on from *Valhalla*, a reasonable game at the time, one expects something really special, not 39K of code, nearly 16 of which is Basic. Even the *Break* key is not protected!

I suppose it's my own fault for not waiting for the reviews in your magazine.

Incidentally, the manual with the game says that the game is incompatible with microdrives and full size printers. This is nonsense; after *Breaking* the program it can be directly saved to microdrive, and my Brother EP22 printer works once the appropriate channel is opened.

R Pitman
79 Whitewood Way
Worcester

Dimension error

Congratulations to Peter Patton on his excellent *Microfile* program in Issues 46 and 47 for the *Amstrad*.

Unfortunately there appears to be an error in the dimensioning of the data array leading to a 'Subscript out of range' report when a very large amount of Data is held, caused by not taking into account that the free memory is affected by the length of the existing file.

This is easily corrected by changing lines as follows:

```
1870 INPUT #9,t
1900 INPUT #9,j:GOSUB 2350
2380 DIM dat(free+j,y):
RETURN
```

The program can be further enhanced by the addition of a printer option to the *Search* and *Browse* sections. One way of obtaining this which will print out the whole of the entry shown can be obtained as follows although a different layout of the fields can readily be obtained by the order in which the elements are called. Change lines:

```
970 GOSUB 2310:LOCATE
5,23:PRINT "(Q)uit, (F)or-
ward, (B)ack, (J)ump, (D)e-
lete, (A)mend, (+)=Add,
(P)rint"
1260 GOSUB 2310:LOCATE
20,23:PRINT "(P)rint, (Q)uit,
or (R)e
1320 GOSUB 2310:LOCATE
10,23:PRINT r;(P);r;"rint,
";r";(Q);r;"uit, or
";r";(C);r;"ontinue Search";
run Search";l=1:GOSUB
2150:m=UPPER$(m)
```

And add Lines:

```
1046 IF m="P" then GOSUB
2500:GOTO 970
1335 IF m="P" THEN GOSUB
2500:GOTO 1320
2500 REM ***** PRINT
*****
2510 FOR i=1 to y
2520 PRINT #8,dat(x,i);
";NEXT
2530 PRINT #8
2540 RETURN
```

D G Shedden
Lomond
The Green
Belchamp St Paul
Sudbury
Suffolk



"You can contact me through Prince Philip's personal mailbox."

Broken promises

It would appear (December 20 issue) that Sinclair now has no intention of honouring Nigel Searle's promise to cut the price of microdrive cartridges.

We long-suffering Sinclair users have grown used to waiting for the latest wonder machine.

Do we now have to get used to them wailing on their promises as well?

I am sure that many people must have bought Spectrums and QLs on the basis that a considerable decrease in the price of cartridges would at last make Microdrives a reasonable alternative to floppy discs.

It seems that once again we have been misled.

In my opinion Sinclair are compensating themselves for a relatively small profit margin on the QL by maintaining a ludicrously high price for the cartridges. After all, once customers have committed £400 to buy the computer, they are then obliged to buy the cartridges.

Is this the real reason why there is no cassette interface on the QL?

A Yarwood
61 The Ridge
Marple
Stockport

All the extras

About a week ago I bought myself a Christmas present of that excellent game of *Chess* by Psion.

Then it occurred to me. I had just spent £20 on a program. You can buy a video cassette with a feature film on it for about the same, which has I don't know how much more black plastic case, and yards and yards of tape, than in your good old Spectrum and QL microdrive cartridge.

Sinclair may sell computers to the masses at hard to beat prices, but he certainly gets his money back on the extras that he knows we can't do without.

P Compton
73 D'Arcy Road
Selby
N Yorks

A Tony Crowther/Quicksilver Production

BLACK THUNDER

*Coming to your
screen soon!*

COMMODORE 64

Cassette £7.95 Disk £12.95



Available exclusively from

QUICKSILVER

in association with The Wizard Development Company Ltd.

DJR

Quicksilver Mail Order, P.O. Box 6, Wimborne, Dorset BA21 7PY.
Telephone (0202) 891744.



Selected titles available at

WHSMITH



WOOLWORTH

John Menzies

and leading multiple retailers and specialist computer stores

AT LAST THE
ARCADE ADVENTURE FROM MICROMEGA



Available through
good computer
stores everywhere.



BY DEREK BREWSTER

22 screens of stunning cartoon animation. Swinging through the trees collect, drop and use the objects scattered around. Speed of reaction is one thing, in Jasper you must also think fast and plan accurately. Can you handle it?



ROTRONICS WAFADRIVE FOR 48K SPECTRUM/ SPECTRUM+

Dual 128K storage. Fast access. Centronics and RS232 interfaces. And now FOUR free wafers from SMT, including the Spectral Writer word processing package. We're now including a free 16K, 64K and 128K wafer with each Wafadrive. All this makes the price of £129.95 (inc. p & p) even more attractive.



The Rotronics Wafadrive has now proved itself as the storage system that offers more. More features, more reliability and more speed. Its micro interface, two 128K drives, RS232 and Centronics ports are all contained within one attractively-styled, compact unit. Wafadrive achieves very fast loading and saving but not at the expense of reliability, which is on a par with floppy disk.

The fully interchangeable wafers are available in three sizes - 16K, 64K and 128K. Low capacity wafers are most



suitable for program development as they offer faster access. High capacity is most suited to general data storage. Loading rate is well over ten times as fast as cassette!

Software selection is ever growing - see list below for details. A full colour brochure on Wafadrive and up-to-the-minute software and accessory information is available.

Look to SMT for the best deal on all Rotronics peripherals

ROTRONICS DX-85 DOT MATRIX PRINTER

High quality and high speed. The DX-85 prints bi-directionally at 100 cps, logic-seeking. It offers a 96 character set at 10/12.5/16.5 cpi which extends column width up to 132 characters. Programmable typefaces including extended and italic. Centronics interface standard and free dust cover supplied. Options include typewriter ribbon adaptor, telex roll holder, RS232 serial interface and sheet feeder.

See our special price when bought with Wafadrive. This offer also applies to previous SMT Wafadrive customers (proof of purchase required).



ROTRONICS PORTABLE CASE

Tailored foam insert holds ZX81/Spectrum/Spectrum+/VIC20/CBM64, with C2N/DR2301 manuals and cassettes within executive style case. All components remain fully operational in situ.



Size 138mm x 700mm x 363mm.
ONLY £34.45 (p & p £2.50).



ORDER FORM

| | |
|---|----------------|
| Please send (enter as appropriate) | |
| Rotronics Wafadrive | @ £129.95 each |
| Rotronics DX-85 Printer | @ £199.95 each |
| Wafadrive plus 48K 128K Printer | @ £299.95 each |
| Rotronics Portable Case for ZX81/Spectrum/Spectrum+/VIC20/CBM64 with C2N/DR2301 | @ £34.45 each |
| 256 wafer | @ £7.00 each |
| 64K wafer | @ £3.00 each |
| 128K wafer | @ £3.00 each |
| Interface/Adapter 8 | @ £14.95 each |
| Speech Writer/Software Adapter/Unit | @ £14.95 each |
| Atkins | @ £9.95 each |
| Serial Reader/Writing's Station | @ £9.95 each |
| Lexology World Code | @ £9.95 each |
| Star Trek | @ £9.95 each |
| Star Trek | @ £9.95 each |
| 2400 Machine Code | @ £9.95 each |
| Shenick | @ £9.95 each |
| MSD/2 wafer | @ £9.95 each |
| Centronics Head | @ £9.95 each |
| All prices include VAT and p & p | TOTAL £ |

- ☐ I enclose a cheque/PO* made payable to SMT
☐ Debit my Access/Barclaycard* account no. (delete as applicable)

Signature _____

Name _____

Address _____

PCW/191

Send to: SMT, FREEPOST,
Greens Norton, Towcester,
Northants, NN12 8ER.
(no stamp required)

Please allow 25 days for delivery

VIC 20 and CBM 64 are registered trademarks of Commodore Business Machines.



Pupae Peril

Can you find your way back home in this game of Pupae Peril by P Sayer and M Lawton?

In this game, you control the path of Bertie the Caterpillar who, after his daily raid on the local cabbage

patch, finds the path back to his home blocked by various kinds of vengeful debris.

Guide Bertie left and right (using keys 1 and 0 respectively) to see how well you can do.



Within the program listing, underlined lower-case letters within quotation marks (ie "a") denote user-defined graphics.

```

1 REM Berty bug By P.Sayer M.Lawton
2 GO TO 550
3 BORDER 0: PAPER 0: INK 7: BRIGHT 1: CLS
4 PRINT AT 10,0:"do you want instructions (y/n)": IF INKEY$="y" THEN RUN 400
5 IF INKEY$="A" THEN GO TO S10
6 GO TO 10
7 LET f=0: LET a=12: PAPER 0: BORDER 1: CLS
8 PRINT BRIGHT 1: INK 3:AT 21,INT (RND*31): "a": PRINT BRIGHT 1: INK 4:AT 21
9 INT (RND*31): "b"
10 POKER 23692: PRINT INK 0:PEEK 23692
11 IF SCREEN$(8,a)<>" " THEN GO TO 150
12 IF INKEY$="r" THEN LET a=a-1
13 IF INKEY$="o" THEN LET a=a+1
14 PRINT INK 2: BRIGHT 1:AT 8,a:"a"
15 PRINT INK 2: PAPER 6:AT 21,0:"T": PRINT INK 2: PAPER 6:AT 21,31:"d"
16 LET f=f+1: IF f=700 THEN GO TO 190
17 GO TO 40
18 PAPER 0: BORDER 4: CLS: FOR t=0 TO 10
19 FOR n=1 TO 7: INK n: BRIGHT 1: PRINT " + you wally you hit an obstacle +": P
20 KE 23692: NEXT t
21 NEXT n
22 GO TO 150
23 PAPER 1: INK 6: PAPER 0: BRIGHT 1: CLS: PRINT AT 10,3:"WELL DONE YOU HAVE
24 GOT HOME"
25 FOR f=0 TO 700: BORDER 2: OUT 34300,20: BORDER 3: OUT 34300,20: BORDER 6: N
26 EXT f: GO TO 550
27 FOR f=0 TO 7: READ x: POKER USR "a"+f:x
28 DATA BIN 0011100,BIN 0111110,BIN 01000010,BIN 10000001,BIN 10100101,BIN 0
29 1011010,BIN 01100110,BIN 00011000
30 NEXT f
31 FOR f=0 TO 7: READ x: POKER USR "d"+f:x
32 DATA BIN 11111111,BIN 11000011,BIN 10100101,BIN 10011001,BIN 10011001,BIN 1
33 0100101,BIN 11000011,BIN 11111111
34 NEXT f
35 FOR f=0 TO 7: READ x: POKER USR "s"+f:x
36 DATA BIN 00000011,BIN 00000011,BIN 00011100,BIN 00111100,BIN 01101100,BIN 1
37 011000,BIN 01110000,BIN 00100000
38 NEXT f
39 FOR f=0 TO 7: READ x: POKER USR "h"+f:x
40 DATA BIN 0011100,BIN 00101010,BIN 01100110,BIN 10100101,BIN 00011001,BIN 0
41 1010010,BIN 01111100,BIN 00111000
42 NEXT f
43 BORDER 0: PAPER 0: CLS: PRINT BRIGHT 1: INK 3:AT 0,9:"-----"
44 PRINT BRIGHT 1: INK 3:AT 1,10:"BERTY BUG"
45 PRINT BRIGHT 1: INK 3:AT 1,9:"-----"
46 PRINT INK 7: BRIGHT 1:AT 4,1:"By Michael Lawton 1984":AT 5,0:" & Phil Sa
47 yer"
48 PRINT INK 5: BRIGHT 1:AT 7,0:"You (Berty the caterpillar) have just made yo
49 ur daily raid on the local cabbage patch. You are now on your way home, you have ju
50 st turned a corner and... But wait what is this its COLIN cabbage and all his
51 friends (including SIMON the spray can & WALLY wall) and BOY do they look angry
52 Soon you find they are after you because you kept eating all of their friend
53 s for lunch. You decide you had better move fast.
54 P 0.1,7: BEEP 0.1,4: BEEP 0.4,4: BEEP 0.8,12: BEEP 0.1,12: BEEP 0.1,11: BEEP 0.4
55 9: BEEP 0.1,7: BEEP 0.4,5: BEEP 0.1,5: BEEP 0.1,4: BEEP 0.4,2: BEEP 0.4,2: BEE
56 470: BEEP 0.1,4: BEEP 0.1,2: BEEP 0.4,2: BEEP 0.1,4: BEEP 0.1,1: BEEP 0.1,7: BEE
57 7: BEEP 0.1,4: BEEP 0.1,2: BEEP 0.4,2: BEEP 0.8,11: BEEP 0.1,11: BEEP 0.1,7: BEEP 0.4
58 0.4,0
59 BEEP 0.1,12: BEEP 0.1,12: BEEP 0.3,11: BEEP 0.3,14: BEEP 0.3,8: BEEP 0.3,11
60 BEEP 0.3,12: BEEP 0.6,4: BEEP 0.1,12: BEEP 0.1,12: BEEP 0.3,11: BEEP 0.3,14: B
61 EEP 0.3,8: BEEP 0.3,11: BEEP 0.3,12: BEEP 0.3,12: BEEP 0.1,11: BEEP 0.4,9: BEEP
62 0.1,7: BEEP 0.1,4: BEEP 1,4: BEEP 1,3: BEEP 0.5,4: BEEP 0.5,5: BEEP 0.5,4: BEEP
63 0.5,4
64 PRINT FLASH 1: INK 2: PAPER 6:AT 21,8:" PRESS ANY KEY "
65 PAUSE 0
66 BORDER 0: INK 0: PAPER 5: CLS
67 FOR n=0 TO 21: PRINT AT n,0:" "
68 PAUSE 5: NEXT n
69 GO TO 30
70 BORDER 1: PAPER 5: CLS
71 FOR n=0 TO 21: PRINT INK 1: PAPER 5:AT x,0:"d": PRINT INK 1: PAPER 5:AT
72 x,30:"a": NEXT x
73 FOR n=2 TO 29: PRINT INK 1: PAPER 5:AT 0,n:"d": PRINT INK 1: PAPER 5:AT 1
74 x,4: PRINT INK 1: PAPER 5:AT 21,x:"d": PRINT INK 1: PAPER 5:AT 20,x:"d": NE
75 XT x
76 PRINT INK 0:AT 7,7:"you took ";f;" steps": PRINT INK 0:AT 8,9:"towards ho
77 me"
78 PRINT INK 0:AT 11,5:"The computers comments:"
79 IF f=100 THEN PRINT INK 1:AT 12,7:"Absolutely pathetic"
80 IF f=200 AND f=100 THEN PRINT INK 1:AT 12,12:"Rubbish!"
81 IF f=300 AND f=200 THEN PRINT INK 1:AT 12,10:"feeble Mate"
82 IF f=400 AND f=300 THEN PRINT INK 1:AT 12,11:"Garbage"
83 IF f=500 AND f=400 THEN PRINT INK 1:AT 12,9:"A bit better"
84 IF f=600 AND f=500 THEN PRINT INK 1:AT 12,5:"WELL not too bad"
85 IF f=700 AND f=600 THEN PRINT INK 1:AT 12,4:"NOT bad for a beginner"
86 IF f=700 THEN PRINT INK 1:AT 12,2:"Okay show off": PAUSE 0.2: GO TO 5
87 BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,2: BEEP 1,2: BEEP 1,2: BEEP 1
88 1,3: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
89 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
90 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
91 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
92 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
93 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
94 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
95 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
96 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
97 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
98 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
99 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
100 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
101 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
102 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
103 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
104 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
105 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
106 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
107 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
108 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
109 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
110 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
111 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
112 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
113 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
114 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
115 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
116 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
117 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
118 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
119 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
120 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
121 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
122 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
123 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
124 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
125 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
126 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
127 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
128 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
129 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
130 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
131 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
132 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
133 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
134 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
135 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
136 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
137 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
138 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
139 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
140 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
141 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
142 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
143 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
144 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
145 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
146 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
147 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
148 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
149 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
150 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
151 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
152 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
153 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
154 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
155 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
156 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
157 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
158 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
159 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
160 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
161 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
162 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
163 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
164 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
165 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
166 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
167 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
168 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
169 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
170 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
171 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
172 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
173 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
174 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
175 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
176 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
177 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
178 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
179 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
180 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
181 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
182 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
183 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
184 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
185 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
186 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
187 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
188 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
189 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
190 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
191 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
192 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
193 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
194 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
195 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
196 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
197 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
198 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
199 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
200 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
201 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
202 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
203 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
204 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
205 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
206 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
207 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
208 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
209 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
210 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
211 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
212 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
213 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
214 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
215 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
216 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
217 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
218 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
219 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
220 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
221 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
222 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
223 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
224 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
225 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
226 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
227 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
228 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
229 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
230 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
231 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
232 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
233 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
234 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
235 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
236 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
237 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
238 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
239 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
240 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
241 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
242 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
243 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
244 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
245 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
246 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
247 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
248 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
249 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
250 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
251 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
252 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
253 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
254 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
255 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
256 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
257 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
258 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
259 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
260 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
261 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
262 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
263 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
264 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
265 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1,5: BEEP 1
266 1,5: BEEP 1,5: B
```


AMSTRAD

SPEEDMASTER
Get up with waiting for programs to load! Speedmaster is the answer - it will allow you to load any program in under 10 seconds! 100% acceleration! An invaluable utility!

ONLY £7.95

B.B.C.

TAPE TO DISC UTILITY
A very useful utility which allows you to transfer programs from tape to disc. It is very easy to use and will save you a lot of money!

ONLY £9.95

ATARI

TAPE TO DISC UTILITY
A very useful utility which allows you to transfer programs from tape to disc. It is very easy to use and will save you a lot of money!

ONLY £9.95

COMMODORE 64

BEST RANGE OF UTILITIES FOR THE 64. WRITTEN BY PROFESSIONALS - SOLD BY PROFESSIONALS

DISC DIRECTOR

At last a really powerful disc director and file manager! It will allow you to manage a properly indexed disc. It will allow you to manage a properly indexed disc. It will allow you to manage a properly indexed disc.

ONLY £29.95

FASTBACK

Current and back issues of software in high speed! It will allow you to manage a properly indexed disc. It will allow you to manage a properly indexed disc.

ONLY £9.95

ROCKET

Feed up waiting! It will allow you to manage a properly indexed disc. It will allow you to manage a properly indexed disc.

ONLY £7.95

3M SCOTCH

DISCS
S.S.D.D.

ONLY £7.95

DISC DIRECTOR

At last a really powerful disc director and file manager! It will allow you to manage a properly indexed disc. It will allow you to manage a properly indexed disc.

DISCO

We guarantee it is the best! It will allow you to manage a properly indexed disc. It will allow you to manage a properly indexed disc.

ONLY £9.95

BIGMOUTH

The super high speed synthesizer program for the 64. It will allow you to manage a properly indexed disc. It will allow you to manage a properly indexed disc.

ONLY £7.95

DOUBLER

The amazing new cassette special utility for the 64. It will allow you to manage a properly indexed disc. It will allow you to manage a properly indexed disc.

ONLY £12.95

COMMODORE CONNEXION

Connect any Commodore type printer to your 64. It will allow you to manage a properly indexed disc. It will allow you to manage a properly indexed disc.

ONLY £14.95

HARDWARE

At last a really powerful hardware utility! It will allow you to manage a properly indexed disc. It will allow you to manage a properly indexed disc.

ONLY £11.95

Sound Generator

A Programme for the 48K Spectrum



GET MORE FROM SPECTRUM SOUND
£6.95

Inc Post & Packing

With nine parameters at your disposal you can change the basic shape of your 48K Spectrum sound and construct a wide variety of sound effects.

Name

Address

I enclose a cheque/postal order for £

for sound generator.

PARKGATE PUBLISHERS

24 LONDON ROAD, APSLEY
HEMEL HEMPSTEAD, HERTS

04947

VicOdden's of London Bridge

Open
8.30-6pm
Mon to Fri
& 9.00-1pm
Sat
Closed on Satur-
days preceding Bank
Holidays

**MICRO COMPUTER
CENTRE**

6, London
Bridge Walk
London SE1

Tel:
01- 403 1988

Prices correct at time of going to press E&OE
All offers subject to availability

Commodore 64 Package



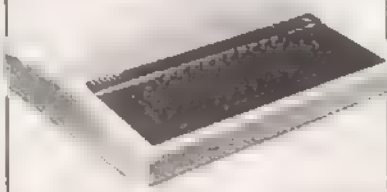
Including:

- Commodore 64
- Quickshot II Joystick
- 1530 Cassette Recorder
- 4 Software Tapes

VIC's Price
Only

£245⁰⁰

BBC Model B Package Offer



HURRY!
Offer extended
**WHILE
STOCKS
LAST!**

Including FREE!
8 Pieces of Software
when you purchase a BBC 'B'

VIC's Price Only

£389⁰⁰

The BBC Model B is probably the most flexible personal computer available today, using powerful BBC BASIC the BBC Basic which is accepted as providing the most comprehensive standard for computer programming. The Model B features a variety of interconnects allowing easy connection not just of ordinary peripheral devices but also second processors or devices to give access to data bases or peripherals.

Sensational Sinclair Offer



**Including
FREE!**

- Computer Scrabble
- Computer Chess
- Survival game
- Chequered Flag game
- Horace goes Skiing game
- Make-a-Chip

VIC's Price
Only

£124⁹⁵

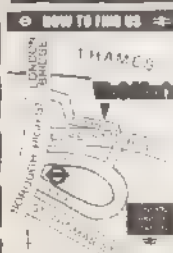
Interest Free Credit Up to £1000

Up to £1000 Instant Credit available to callers who hold a current Clearing Bank Bankers Card or Credit Card for identification. Mail Order customers can apply for a Budget Account Card - please send for application form.

We also stock a
wide range of
other software
& add-ons,
please call in
and see!

Part Exchange

We will give you our top offer for your computer/hi-fi/photo-gear and related items in part exchange. We also buy computers and peripherals for cash.



Access: Visa, Trust and 3 Creditcharge orders can be accepted by post on the telephone on 01-403 1988, 01-407 6853. 3rd day normal working hours. There is no surcharge on any credit card orders.

ALL MAIL ORDERS to:
6 London Bridge Walk,
London SE1 8XX

INSTANT CREDIT UP TO £1000

Up to £1000 instant credit available to callers who hold a current Clearing Bank Bankers Card or Credit Card for identification. Mail Order customers can apply for a Budget Account Card - please send for application form.

VicOdden's

MAIL ORDER SERVICE

All mail order & phone enquiries to 6 London Bridge Walk 403 1988

Name
Address

MAIL ORDER POST FREE!

The main chance

Graham Taylor talks to electro-rock band - Mainframe

After Frankie goes to Hollywood shot up to the top of the music charts with *Relax* it didn't take long before criticisms of the band began to appear in the music press.

Charges that the band were manufactured in the studio, that they had little musical ability and that they were largely the result of producer Trevor Horn being very clever with an array of synthesizers and computerised musical instruments, were all levelled against the band.

However unfair these criticisms may be, the fact they were made at all is of significance.

What they imply is that somehow computers let you 'cheat'. Have micros advanced so far that the importance of musical invention can somehow be reduced by technology?

But what has all this to do with a young new band called Mainframe? Mainframe is Murray Munro and John Molloy who together are using much of the same kind of technology as the Trevor Horns of this world, but at a level of expenditure that a small amateur and semi-professional group might afford.

It is with bands like Mainframe rather than studio superstars like Trevor Horn that the real test of new musical technology occurs. How is the best used on a day to day basis? What does it add or take away from musical creation?

John and Murray began by playing, respectively keyboards and guitar in a five-piece rock band called Limeshore. Murray taught himself guitar in the way most rock guitarists do, picking it up as he went along, John learnt the piano to Grade 8 (that's pretty goodish) in the usual classical way. They left to form Mainframe which despite a vaguely esoteric tech image was always intended to be a viable gigging band. The base and drum parts were played by a four track tape deck, its spools turning ominously throughout a set - it was a technique also used by Orchestral Manoeuvres in the Dark for a time.

The technical developments that have substantially reshaped Mainframe's sound since then began as a venture into computer graphics.

John explained, "We had an Apple we were using and a user group we met two people - Colin Holgate and David Green - and we began working with them to create computer graphic shows for our stage act."

The computer graphics were well received and grew in complexity. "David reached the point where he wanted to take the sounds we were making and directly input them into the computer

and turn them into graphic effects. The conventional tape interface proved not up to the task and a special board of electronics had to be constructed to convert sound input to graphics."

Murray told the slightly bizarre story of what happened next. "Dave sent in an input wave and instead of using it to create graphics sent it out again in an altered form. We were sent it to have a listen to and after two weeks we finally all got around to sitting down with a tape deck - it was awful." Dave was consulted.

"He told us the original sound he had sampled was from a cassette tape - no wonder it was awful. We tried again then from a decent sound source and it actually sounded fine."

The end result of all this unplanned development was a sound sampling system that did much of what studio systems costing hundreds of thousands of pounds can do. Well, pretty much, anyway.

The system, a board which plugs into any Apple II was named the DS:3 and was shown around and received much acclaim from such luminaries as Thomas Dolby's keyboard player and Dave Stewart (of *It's My Party* fame). More importantly the system has picked up a lot of sales from the smaller music studios who can't afford the likes of a Fairlight - as used by Frankie - and costing £30,000 at the last count.

The ubiquitous Midi interfacing system will be added to the system soon.

Murray Munro (left) and John Molloy



"Midi is basically a very good thing but the standard is not quite a standard yet. You can still connect together two keyboards by the same manufacturer and the sustain pedal on one keyboard won't work the other, no matter what you do."

"Nevertheless it'll be a useful addition to the DS:3, mainly because people will be able to use their favourite keyboard to play the sounds. For example, a lot of people want to connect a Yamaha DX7 up to it."

All this ingenious technology gives Mainframe and the other bands who use similar systems a great deal of freedom.

Think of what it implies. Any sound you can hear from dog barks (a popular choice, that) to a whole orchestra playing, to breaking bottles to thunder and lightning can be stored, altered and played back on a keyboard at various pitches.

But what should be done with this extra freedom, and what use actually is being made of it? John commented, "In terms of sounds I think it's fair to criticise much of what has been done so far with computers. What's happened is that everybody has found the Fairlight at the end of the studio, but either hasn't wanted or hasn't had time to investigate sampling properly. Consequently, they tend to use the sounds that come with the machine instead of experimenting with it."

"From our point of view that means that with only our DS:3 system we produce sound - comparable with stuff produced on much more expensive equipment - that seems like dozens of musicians including an entire brass section."

Proof that technology needn't take the invention and quality out of music is to be found in Mainframe's recent record *Into Trouble With the Noise of Art*, a 12 inch which uses the DS:3 system almost exclusively to create the sounds, yet produces music of some wit and thought.

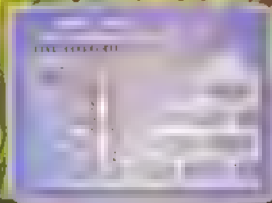
A new track they are working on now can truly be said to include everything and the kitchen sink. "There is everything in it including a bit of us at the kitchen sink" - a recording moment to treasure.

The future for Murray and John looks interesting - YYY records (Ying Yang Yumm) their own record label which put out the *Noise of Art* record, will release follow ups in a broadly experimental area.

But another track I heard, despite the sampling and bizarre noises, revealed a strong sense of hooks and choruses. It might, I thought, almost be commercial. What did that mean, I asked Murray "We'd like a hit single like everyone else, you know," he smiled.

If the technology of music interests you listen to *Into Trouble With the Noise of Art* and try comparing it with the record which it parodies called *Into Battle With the Art of Noise* which features Fairlights and the like.

DEMONS OF TOPAZ



100% GRAPHIC EXPLORATION

firebird

SOFTWARE

A game of distinction  from British Telecom

WELLINGTON HOUSE, UPPER ST. MARTIN'S LANE,
LONDON WC2H 9DL TEL: 01-379 6755/5626

COMMODORE 64

**Gold
Edition
£5.95**

firebird and the firebird logo are a trademark of British Telecom communications plc.

IT'S WHAT YOU'VE BEEN WAITING FOR...

"Domark's first venture is fun and the best I've played" Editor, T.V. GAMER

"Never seen anything like it" SUNDAY TIMES

"Even if you don't win the £25,000, the game is definitely worth playing and will give you plenty of fun doing so" Editor, GAMES COMPUTING

"Game for a lot" DAILY MIRROR

"In this World's oft fruitless search for value for money, a new software package from Domark shouldn't be ignored" YOUR SPECTRUM

Eureka!

IS HERE

ENJOY YOUR SEARCH FOR THE SECRET TELEPHONE NUMBER

Controlled

Hardware Music 500 Micro BBC
Price £199 Supplier Acorn Computers,
Fulbourn Road, Cherry Hinton,
Cambridge CB1 4JN

Acorn have always claimed an impressive line-up of peripherals for the BBC micro, but until now the professional musician has had to look elsewhere for computer based synthesizer control. Not any longer. The *Music 500* from Acorn is an add-on synthesizer for the BBC which frees the musically minded from the limitations of the BBC's sound chip and gives them such joys as FM and ring modulation. But the real test of the *Music 500* is in its control language, *Ample* (Advanced Music Programming Language). The claim is that, here, at last, is an authoring language which offers easy control over the complex structures offered by a pro-synth.

So what do you get for £199.00p? The hardware is contained within a slimline disc-drive size case and connects via the 1MHz bus of the BBC. The only other visible connection on the synthesizer is a five-pin DIN socket which is an audio output for connection to an amplifier. Completing the package is a comprehensive user guide, and a tape containing the *Ample* language and several demonstration pieces.

Now there's only one ingredient missing from the above list. Yes, a keyboard! Acorn in their wisdom have decided that a keyboard is not essential to the operation of the synth, such is their confidence in the power of the *Ample* language. Though, as you will see, *Ample* is indeed a fine authoring language, it in no way negates the need for a keyboard and it is a pity that users will have to wait a couple of months for the keyboard to appear. I found it a very annoying feature of an

otherwise impressive product.

So what exactly is *Ample* controlling? Well, the 500 has 16 sound channels and the system has eight voices. This means up to eight notes can be played simultaneously and initially each voice has two channels assigned to it. By combining channels, different effects such as ring modulation, FM, and synchronisation can be achieved.

Up to 13 waveforms can be held in memory by the 500 and this can be used for harmonic synthesis, by telling the system the various strengths of the first 16 harmonics or creating waveforms geometrically by specifying the shape of the waveform point-by-point.

Starting with *Ample* is relatively easy though don't expect any great performances for a while. *Ample* is rather like a *Basic* language for musicians and is entered either as a direct command or as sequence of commands in a program listing. All music notation is entered from the QWERTY keyboard. For instance, individual notes are entered as they are written (CDEFGAB) and the direction of the pitch is shown by either lower or upper case lettering, where the former is going down and the latter up. Other straightforward controls over duration and tempo are just as easily performed.

Ample has a large set of built-in words which control the fundamentals of changing sound. But the real power in the language is that the user can build his own definitions. This means the user can create his own effects, arrange a certain part, create new wave or envelope effects, instruments or note sequences and then call it up by name, therefore defining his own procedure. This is then

another *Ample* word which is executed in the same way as a built-in command.

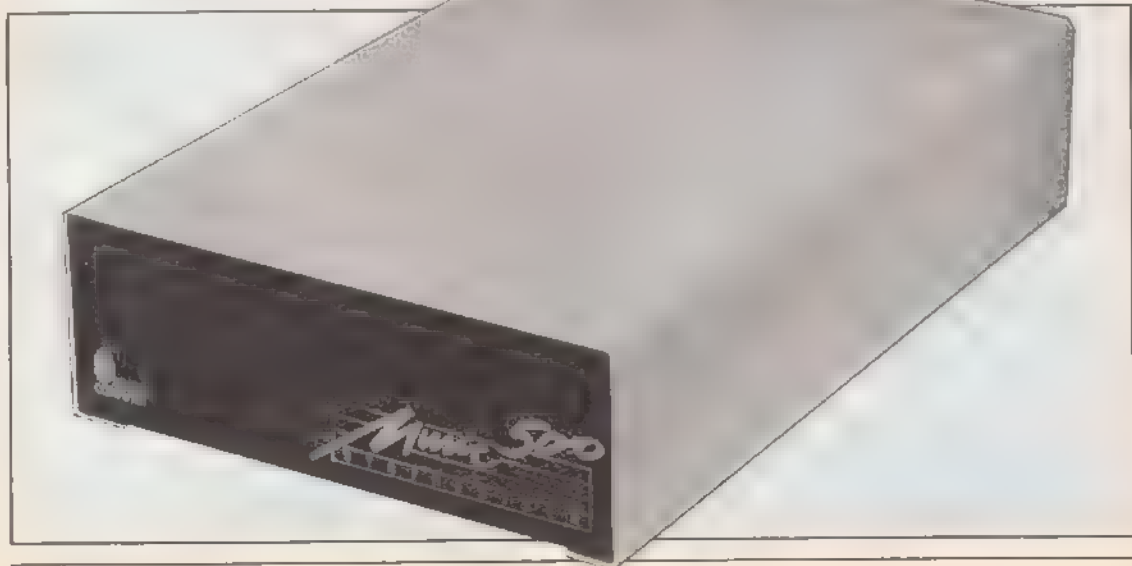
Couple all this with the ability to run events concurrently and you have multi-part music at your fingertips. Well, in theory. It all depends on your enthusiasm and patience for *Ample*. It's without a doubt a very powerful control language but it is also time consuming. You'll either love it or hate it. I'm gradually learning to love it and appreciate the control structures it offers.

So is it worth the expense? If you already have a BBC, a most emphatic YES! However, if you are considering buying a micro plus synthesizer then Yamaha's CX5 is a strong contender. Acorn has tackled the problem of micro-control totally differently to the CX5. On a quick comparison the CX5 would win easily. The major criticism of the 500, besides the lack (at the moment) of a keyboard, is the fact that Acorn have made no attempt to use the graphics capabilities of the micro to assist the user. Yes, I know that the old Beeb eats up memory as soon as you draw a matchstick man, but surely someone could have exercised some imagination. *Ample* is great but I would prefer to enter music on a staff and not by typing in letters on a keyboard. This leads on to the other major criticism that unlike the CX5 the 500 is not instantly usable.

However, at the end of the day the contest is very close. The hardware of the 500 is excellent and offers possibilities beyond the limitations of the FM based CX5. As it stands the *Music 500* is a pro-musicians tool and hasn't the instant appeal of the CX5 which will go down well with the amateur dabbler. *Ample* is worth learning with much scope.

Overall I was impressed by the quality of the sound and the entire package. It is a most welcome addition to my BBC.

Jeremy Vine



No clone

Hardware CX5ME Prices: CX5 - £449.00 Mini Keyboard - £85.00 or Full-size keyboard - £165.00 Software Roms - £36.00 each Single cartridge adaptor - £19.00 Data memory cartridge - £65.00

Supplier Yamaha-Kemble Music Ltd, Mount Ave, Bletchley, Milton Keynes

Once you've seen one MSX machine, you've seen them all. A statement that is generally true unless you have a Yamaha CX5. It's no ordinary MSX micro and this is immediately noticeable by its price. For those acquainted with the DX series of synthesizers, Yamaha have produced a fully-fledged micro that conforms to the MSX specification but offers a big plus in the inclusion of an 8-note polyphonic FM synthesizer, that virtually makes the DX9 obsolete, as it rivals the DX9 in almost every feature for a few hundred pounds less in price!

Is it a computer plus synth or synthesizer plus micro? Well, Yamaha have designed the CX5 for both the amateur and pro-musician and are retailing the machine almost exclusively through music shops rather than computer stores. The basic system includes the FM synthesizer and it is not possible to buy just the MSX computer and then upgrade. The complete package comprises the micro with the synth module built into the underside of the micro, a piano type keyboard (either mini or full-size) which connects to the micro and a rather bulky separate power supply unit.

A look around the micro reveals the usual array of ports for printer, joystick, cartridges, TV, cassette, etc. In addition there are five sockets which are part of the synth module giving a pair of Midi In-Out sockets, a pair of phono audio outputs (left and right) and connector for the music keyboard. One thing that stands out is the non-standard implementation of the Midi interface, which is parallel rather than serial. However, in all other respects the micro appears to be the standard MSX job except that it comes with 32K Ram (on the low side against other MSX micros).

I won't dwell too much on the MSX features as they are well known by now. The keyboard (that is the QWERTY keyboard) is pleasant to use and the micro performed in the way any other MSX machine behaves. The departure point in this beast is a built-in software package to access and make use of the FM synthesizer.

By simply typing in *Call Music*, the screen then displays five main blocks of information which allow control over the polyphonic and monophonic voices. The keyboard is immediately playable and there are 46 preset voices available to the user. Brass, electric piano, strings,



wind and a host of other sounds are at the user's fingertips and the effects have to be heard to be believed. This is, of course, one of the outstanding features of FM synthesis and Yamaha couldn't have made it any easier to access these sounds.

It's possible to split the keyboard at any point so that one hand can play a polyphonic voice and the other, monophonic. In addition these two voices can be separate, enabling a different instrument to each voice.

The second main block menu is the rhythm section and allows an automatic rhythm accompaniment. Other features include record and playback of music from the keyboard and alteration of the voice parameters. The built-in package is far from mind-blowing but is a gentle, simple introduction and is especially good for those who want to play a few quick notes with a host of instruments.

The real stunner about this system is the art of the possible, or to be more exact, what Yamaha has made possible for the musician. Yamaha has taken full advantage of the micro to make control of the synth a doddle. To compliment the system, a range of software cartridges are available that extend the capabilities of the micro. In particular, they have made the logical step of using a micro to display visual information about the synthesizer.

The first Rom cartridge I selected was the *FM Music Composer (YRM101)*. Unlike the *Music 500* from Acorn (which is reviewed elsewhere in this issue), music can be entered in standard musical notation on staves shown on-screen. Up to eight parts can be played simultaneously and the music can be played back either through the Midi interface and/or the internal synth.

The criticisms of this package, and they are far from major, is that only one part is visible at any one time and the less advanced musician would have problems synchronising parts. Entry of

the music is not as straightforward as it could be and takes some getting used to. Criticisms aside, the program is a delight. Being able to see and use musical notation is a very attractive prospect and once the initial difficulties of key-entry are solved, multi-part harmony with different instruments is child's play. Each part can be dumped to a printer for a permanent record and compositions can be saved to the cassette recorder. All in all, a great package.

I mentioned earlier that the built-in software had its limitations and to remedy that problem, Yamaha have produced the *FM Voicing Rom (YRM102)*. One of the complicated elements of FM is that there are many (in this case over 60) parameters that can be altered. On the DX synth this was never an easy job but with the CX5 and the voicing Rom, life is certainly easier. This package allows the user to change existing voices or create new ones by presenting all the various parameters of the voice on one screen.

Changing the parameters is dead easy by moving the cursor around the screen. But no matter how much easier the task is made, an appreciation of how sound is created and in particular how FM synthesis works is required. The manual does a good job here and for both the amateur and professional this cartridge is a must for exploring the almost infinite range of sounds possible.

With the Basic programmer in mind, the *Music Macro Rom (YRM104)* extends the range of Basic commands to allow the synthesizer to be controlled from Basic programs. I suspect that this will be the least used package as most owners will find their musical needs adequately catered for by the other software. But it's good to see how much thought Yamaha have put into this system and control of all the hardware from Basic, including control of the Midi interface, is a necessity to complete the system for all possible users.

The fourth and final cartridge avail-

able at present is aimed at owners of the DX7. If there's one thing more difficult than altering the CX5's voicing parameters, it's the DX7! In a similar fashion to the FM voicing cartridge, the *DX7 Voicing Program (YRM103)* displays graphically the different parameters and allows on-screen editing which is relayed via the Midi interface to the DX7. There will probably be many DX7 owners who will give serious consideration to purchasing the CX5 just to ease their nerves. ■ sure takes the mystery out of that LCD display!

After a few weeks of using the CX5, I am still as impressed with it as the first time I saw (and heard) it. It is a remarkable package and full marks to Yamaha for a well thought-out, well designed machine. If there are criticisms to be made they are not against the system, for that is without a doubt excellent, but rather the marketing policy of Yamaha in Britain.

As I indicated earlier the system is only available with the built-in synth module and it is this which places the micro outside most people's financial reserves, and indeed those many music amateurs. This is a great pity. It would have been preferable to see the CX5 available as a micro, with the FM synth unit available as an upgrade. I can understand Yamaha wishing to market the

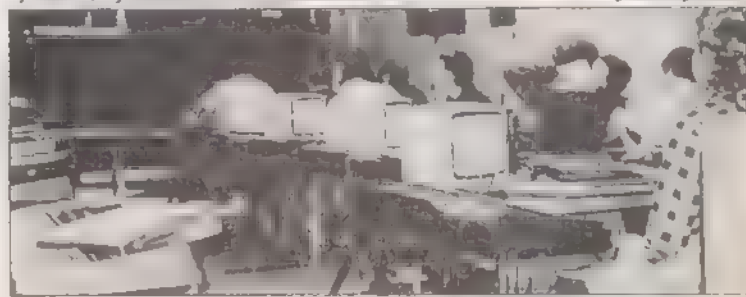
CX5 with emphasis on the music aspect but they are alienating many potential micro purchasers who can't afford the entire package, but would in the long-term wish to have the addition of a pro-synth unit and keyboard. Come on Yamaha, surely you want to sell more of these machines?

As far as the pro-musician is concerned the CX5 is a bargain. To get almost the entire facilities of a DX9 plus a micro for three hundred pounds less is almost too good to be true. The only other major competition in the same price bracket is the BBC plus Music 500. Without a doubt the CX5 is a far more friendly package to use and ■ present offers more than the Acorn system with the exception of the limitations of FM synthesis, if you consider that a limitation

exists. As I pointed out in the Music 500 review, the control of a synthesizer has been approached from two different directions. The Yamaha method is far more appealing to the first time user and is the friendlier face of software. The Acorn approach is far less friendly yet very sophisticated and coupled with excellent hardware. For ease of use, though, Yamaha wins.

Overall, I can't sing the praises of this system highly enough. If the first batch of software ■ anything to go by, the future developments of this system must be very bright indeed and Yamaha have hinted strongly at new packages and peripherals taking the system even further, but no firm details have been released as yet. I can't wait!

Jeremy Vine



Simple sample

Hardware Digital Sound Sampler
Micro Spectrum Price £49.95 **Supplier** Datel Electronics, Unit 8, Fenton Industrial Estate, Dewsbury Road, Fenton, Stoke-on-Trent.

While the music world has been familiar with the idea of sound sampling for a couple of years, the necessary technology hasn't been cheap enough to apply to home computers until quite recently. Still, systems like the £20,000 Fairlight Computer Musical Instrument, the £500 Greengate DS3 Sampling System for the Apple computer, and Datel's new £50 device, have a

good deal in common.

Plugging into the Spectrum's user port, the Digital Sound Sampler (DSS) can take any sound input up to around two seconds in length, coming either from the small microphone supplied or from a line level input, and reduce it to digital information. Recreating the sound at different pitches by putting it through a digital-to-analogue converter and amplifier is then easy - the device just "plays back" the sound at a different clock rate.

The unit worked first time, though some adjustment of input levels was necessary. The four programs supplied on tape allow you to sample and replay a sound in many ways.

A sample can be replayed forwards or

backwards at a variety of pitches using the keys 1 - 8 on the Spectrum. A frequency chart can be plotted, or the sound can be looped with a progressively faster repeat, or rising pitch repeat. The DSS will also act as a primitive echo unit. Four short sounds, ideally drum-type noises, can be recorded sequentially, then played back with keys 6, 6.7 and 8.

There are also programs which turn the Spectrum's QWERTY keyboard into a music keyboard - though it's very difficult to get an acceptable standard of playing out of it. It's much better to leave any serious composition to the sequencer program, which allows you to store 1000-note tunes and play them back at any speed. There's also a program to help you incorporate sampled sounds into games.

Overall, the Datel Digital Sound Sampler is a fascinating toy for musicians interested in sound sampling techniques, or for novelty seekers who can afford £50 for a gimmick which may lose its appeal after you've heard your Spectrum saying "hello" in tones from a deep bass to a high soprano.

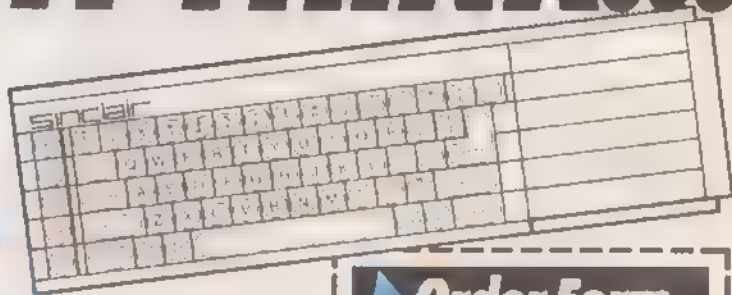
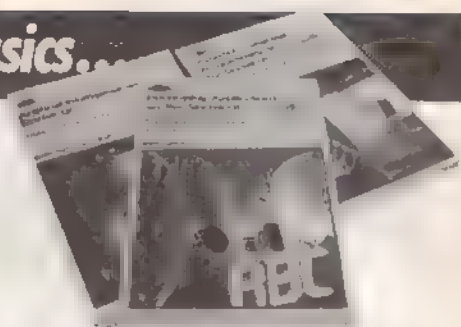
However, since the software is fairly primitive and badly needs replacing with a fully integrated, machine-code program, and since there's no way to interface the DSS with a real music keyboard of any kind, for real musical applications you should keep saving for that Apple/DS3 system.

Chris Jenkins



▶ **Introducing the latest QL QClassics...**

▶ **APPLY IT, PROGRAM IT, MAKE IT THINK...**



▶ The three latest books on Sunshine's superb QL QClassics series are now available at your local bookshop or computer dealer. Let's take a look at the first one. **Developing Applications on the Sinclair QL**. It's full of practical ideas for making the most out of Quill, Easel, Abacus and Archive, for both your home and business. Ideal for both beginner and expert, Mike Grace's book gives you the knowledge you need.

▶ Up till now, machine code programming on the powerful 68008 microprocessor in the QL was a daunting prospect. Andrew Pennell's QL QClassic, **Assembly Language Programming**, explains the internal structure, the register set and the many addressing modes – and includes the use of traps and exception handlers. Here are over 160 pages of vital data and advice for QL programmers, and all for just £7.95.

▶ With the new Sunshine book, **Artificial Intelligence on the QL**, you can turn this already highly-

capable machine into an intelligent micro. Your QL will be able to advise you, converse with you, learn from you – and even teach you a thing or two! This QL QClassic explains AI from first principles, and includes example programs and SuperBASIC programming. And all for only £6.95.

▶ These three essential books for every committed QL owner are at your local bookshop or micro dealer now. Or use the direct order form here. And start applying your QL, programming your QL, and making your QL – and you – think, thanks to Sunshine's latest QL QClassics.



Look out for the Sunshine range at WH Smiths, Boots, John Menzies, other leading retail chains and at all good bookshops. Dealer Enquiries: 01-437 4343.

▶ **Order Form**

To: Sunshine Books, 12-13 Little Newport Street, London WC2R 2LD.

Please send me the following book(s) for the Sinclair QL:

- _____ copies of **Developing Applications** at £6.95 each
 - _____ copies of **Assembly Language Programming** at £7.95 each
 - _____ copies of **Artificial Intelligence** at £6.95 each
 - _____ copies of **Quill, Easel, Archive & Abacus** at £6.95 each
 - _____ copies of **Introduction to Simulation Techniques** at £6.95 each
- 60p post & packing

☐ I enclose a cheque payable to Sunshine Books for £ _____

☐ Please charge £ _____ to my ☐ Visa Card ☐ Access Card

Card Number _____

Signed _____

Name: _____

Address: _____

Face the music

Gary Herman sounds out the music software programs for your micro

This round-up covers software designed to turn your computer into any sort of self-contained music machine.

There are roughly two approaches – one uses the computer as a compositional aid and the other uses the computer as an instrument, a sort of synthesizer.

Inevitably, the computer-as-synthesizer software is largely dependent on the quality of the hardware it is implemented on the particular micro – that is, it depends on the programmable sound generator the computer uses.

In this respect, the Commodore 64 has the edge on all other machines, while an unexpanded Spectrum is pretty useless. Every other machine (with the exception of Yamaha's MSX model, the CX6M) falls between these two extremes.

I have avoided the CX6M in this list, since it is, in effect, a computer plus synthesizer. I have also not included Midi software or anything similar requiring the use of a separate synthesizer or rhythm machine. Neither have I mentioned sound sampling devices.

Software is listed by machine and is, roughly, in order of quality – a judgement which combines subjective opinion and an assessment of cost versus features.

Atari 800/800XL

Music Composer (Atari) A neat cartridge-based package which suffers from the sound quality of the Atari programmable sound generator (PSG), but makes up for that with excellent graphics and the ability to write four-part compositions. Comprehensively, if densely, documented and pleasant to use.

BBC Model B

The Synth (Musicsoft) A disc or tape-based set of programs allowing comprehensive and easy control of BBC sound facilities. Best as a performance program, but includes 'recording/sequencing' facilities for composition.

Doug Tate, who produced *The Synth*, also sells a suite of programs called *Keyboards* and one called *Music Tools*, which are extremely useful as guides to musical techniques with the BBC.

The Music System (Island Logic) A beautifully packaged and presented suite of programs aimed squarely at composers. The icon graphics are exceptional and the facilities for notating and printing out compositions are unparalleled.

Acorn Music 500 (Acorn/Hybrid Technologies) A hardware-based system which utilises a specially written music composition language. A powerful compositional tool which gives high-quality digital sound not using the BBC's own PSG. Difficult to use and expensive, but probably worth having.

LVL Echo 1 Add-on keyboard with software. Very cheap at around £100, but unfortunately it seems to be all but unobtainable.

BBC Music Processor (Quicksilver) Turns your BBC into a mock-up synthesizer and four-track tape recorder (a very good implementation, this latter). A cheap and cheerful piece of software, well worth having for amusement, it might also prove a useful addition to the musician's armoury.

Music Synthesizer (Bug Byte) A disappointing program geared to composition rather than real-time performance. I found it extremely tedious to use.

Drum Kit (Quicksilver) A fairly good implementation of a drum machine on the BBC which would be enormously improved with the addition of external amplification. A more interactive approach would have helped, too.

Beebsynth (Clare Micro Supplies) Aimed at the sound experimenter who wishes to explore the BBC's sound capabilities. Useful.

Music Maestro (GTM Computers) Good on sequencing, indifferent in most other areas.

Commodore 64

Music Master (Supersoft) Entertaining and generally well-constructed program, most useful for real-time performance and for setting-up sounds to be used in your own programs. Unfortunately, the sequencing facility is disappointing.

Synth-84 (Abacus/Adamssoft) American program which allows you to compose by means of basic-like programs. Very powerful and fairly easy to use. The documentation could be better, but this program is heartily recommended to composers. **MusiCalc 1 (Waveform/MusiCalc UK)** The first in a suite of programs designed to cover all the musical bases. Originating in the US, **MusiCalc 1** is essentially a sound modification program with some compositional features. These latter are quirky, to say the least, but the sound modification is very well done. A good introduction to the Commodore 64's capabilities.

Music Maker (CBM/Music Sales) You get a plastic clip-on keyboard, an idiot's guide to playing keyboard and some simple if quite amusing software. Not versatile, but very easy to use.

quality. If the promised real-time sequencer and sampler programs live up to expectations, it could be an unbeatable system.

CME 49 (Siel) Another add-on directly competing with the Microsound. So far, I have no precise information about this very new product, but Siel is a reliable synthesizer manufacturer with a keen eye to the home micro market.

LVL ECHO 1 A version for the Commodore. See under BBC Model B entries.

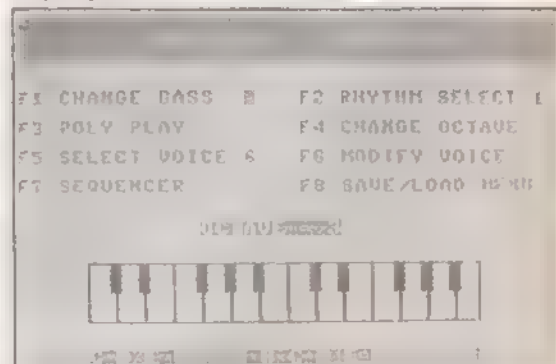
Sinclair Spectrum

Music Typewriter (Romantic Robot) A compositional program which uses the Spectrum keyboard and an overlay to enter notes. Obviously limited by the Spectrum's sound capabilities, but nonetheless a good introduction.

Music Master (Sinclair Research) Turns your Spectrum into a gloriously monophonic home organ. Very quiet and only worth having if you can't get anything else.

Three Channel Sound Synthesizer (DK'Tronics) Hardware add-on allows the Spectrum to produce three channels of sound, like a BBC. Includes a **Music Designer** program, which is a joystick controlled composer/sequencer.

Trichord (Newtech Develop-



Utilisynth 64 (Quicksilver) An overly complicated piece of software, bearing some market similarities to both *Music Master* and *MusiCalc 1*, but not as good as either of them. **Microsound 64 (Autographics)** A keyboard add-on plus software which is, even now, being up-dated.

Well worth investigating since it offers all the C64's facilities and allows real-time performance and step-time sequencing of a fairly good

ments) Hardware add-on, incorporating composer package, internal amplifier and pre-programmed sounds on firmware. Competitively priced and versatile.

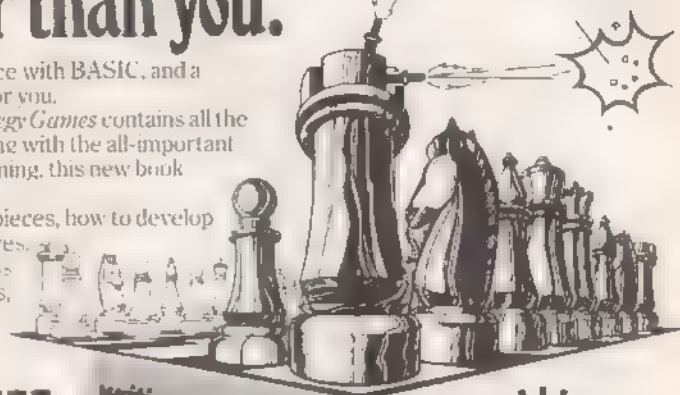
Sound Generator (Ricoll Electronics) Rather expensive (at £45.95) but this hardware add-on does include an internal amplifier and programmable filter. Ricoll's products are usually reliable and the filter makes this an attractive package.

Use your intelligence to write a game that's more clever than you.

If you've a Commodore 64, a nodding acquaintance with BASIC, and a love for real games of strategy, here's the book for you.

John White's latest book, called *Writing Strategy Games* contains all the techniques for intelligent games creation. Starting with the all-important theory, both behind the games and the programming, this new book also details the practicalities involved.

You'll discover how to set up a 'board', move pieces, how to develop standard openings and a variety of endgame moves. If you want to write a Grandmaster-beating chess program, or a four-dimensional game of draughts, then buy this book. Order today from your local bookshop, computer dealer, or by post direct from Sunshine, using the order form.



Please send me *Writing Strategy Games* by John White, Commodore 64, £12.95 plus 50p p&hp. I enclose a cheque/postal order for £ payable to Sunshine Books.

☐ Please charge my Visa Access card No. _____ valid from _____ expires _____

Signed _____
Name _____
Address _____

Send to: Sunshine Books, 12-13 Little Newport Street, London WC2R 1LD

*Writing strategy games
on your commodore 64*

techniques for intelligent games

john white

SUNSHINE

Look out for the Sunshine range in W. H. Smith's, Boots, John Menzies, other leading retail chains and all good bookshops

Dealer enquiries: 01 437 4343

Get more out of your BBC Micro with the New Marconi RB2 Tracker Ball

Marconi's new Tracker Ball is superior to either a mouse or joystick and is easier to use. The RB2 design incorporates Marconi's vast experience in making Tracker Balls for Air Traffic Control and professional equipments which demand maximum performance and reliability. It is drift free and gives more precise positional control - the cursor position on screen relates directly to fingertip movement on the ball. The three push buttons normally control the delete, return and copy functions but you can also assign your own functions to the buttons.



It's perfect, whether your micro is your hobby, an educational tool or a source of low cost CAD/CAM applications. It's ideal for word processing and games too, and unlike a mouse needs no regular cleaning.

If you're a Commodore or Spectrum user don't despair. There will be a Marconi Tracker Ball for you coming out in the Spring.

For full details please complete the coupon.

ONLY £59.50



FREE!

Utilities Program.
Graphics Program for tape or disk.
Micro Draw Program on floppy disk.



To: Central Trade Marketing Ltd.,
Ashton Lodge Ashton Road,
Dunstable Beds. LU6 1NP.
Tel: 0582 61283.
Please send details of the new
Marconi Tracker Ball

Name: _____

Address: _____

Special competition



Popular Computing Weekly offers you a chance to win over £2,000 worth of Siel synthesiser equipment to connect to your micro

1st Prize Siel's new DK600 synth - Value £1,200

The DK600 is an exciting new six-voice polyphonic programmable MIDI synthesiser which we are giving away complete with software packages to link it to either a Commodore 64, BBC or Spectrum computer (whichever is appropriate for the winner).

2nd Prize Siel MK900 MIDI Music keyboard - Value £600

The MK900, which we reviewed in PCW, December 8, is Siel's Midi Home Computer music keyboard which we are giving away together with Midi interface and software to link it to a Commodore 64, BBC or Spectrum micro.

3rd Prize Siel CMK 49 Commodore 64 music keyboard - Value £225

This is a new product from Siel offering a full-feature music add-on for your Commodore 64.

THE prizes will be awarded for the best original music compositions written using a home micro.

What we want you to do is to use your home computer to produce an original music recording. Entrants must submit:

- ★ A tape or disc containing the software program or programs used to produce the composition
- ★ An explanation in less than 1,500 words of the program, how it was written, what it does, and what you have tried to achieve.
- ★ Wherever possible we would like you to provide a printed listing of your music program and composition.
- ★ We would also like you to send a cassette tape recording of your composition.

COMPUTERS are increasingly being used in professional music making and it is possible to link all sorts of

musical instruments to a home micro - drum machines, synths, and so on. The winning entries though will be likely to have been written and played using just an ordinary home micro. You may use any other equipment you wish - for example, a tape recorder to multi-track the finished tape. Any commercially written home micro software packages may also be used, but their use will be taken into consideration.

We are looking more for quality of original composition, good ideas, and some programming skill. At the end of the day, though, it must be music to our ears! Different micros have different music facilities and that also will be taken into account. Don't be put off just because your Spectrum isn't very loud!

The competition will be judged by a panel of experts which includes:

Thomas Dolby
Vince Hill (Siel)
Mark Jenkins (Melody Maker)
Graham Taylor (Popular Computing Weekly)

The decision of the judges will be final.



TO enter you must fill in the form and send it together with your tape(s), listings and/or discs containing your finished composition and explanatory notes, to: Thomas Dolby's Micro Music Composition, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP. At the same time you must also include four out of five special Micro Music vouchers, which will be printed in the next five issues of the magazine. All entries must reach us by midday on March 14 and the winners will be announced in April.

Please find enclosed my entry for Thomas Dolby's Micro Music Composition.

| | |
|---------------|---|
| Name | Micro used |
| Address | Other hardware used |
| | Any commercial software packages used |
| | |
| | |

Final score

Program *Match Day* **Price** £7.95 **Micro** Spectrum 48K **Supplier** Ocean Software, 6 Central Street, Manchester M2 5NS

Over now to Sunshine Towers for news of today's big match.

"Well, plucky Manchester side, Ocean, have now dragged the Spectrum up to the top of the table, just behind the Commodore, by

the smoothly moving players as they run, intercept, shoot for goal and are beaten tenfold by a micro-chip, all seen in satisfying perspective from the grandstand.

"When it comes to the Cup, Ocean have all they need to pull it off; a built-in, knock-out contest, joystick and keyboard options, one or two player versions and changeable team names and colours.

"I was sick as a parrot when the referee, Mr A Bug, made me play a double length first half when I scored in the forty-fifth minute. Greater differ-

ences is well implemented.

The numerical aspects of this version of Logo are far better than most versions on other machines I have seen. The treatment of numbers is not confused in the way that it is on many older Logos and its accuracy is high.

The facilities for controlling recursive procedures (eg. *Throw*) are good and, although, the normal depth of recursion is not that great, tail recursion is treated as a special case, and produces no problems.

Though Acornsoft Logo has its numbers sorted out, it still has problems due to the prefix (plus infix) form of syntax. It does not have an *Equal/Equal?* prefix primitive, for example.

The *Trace* facility, though,

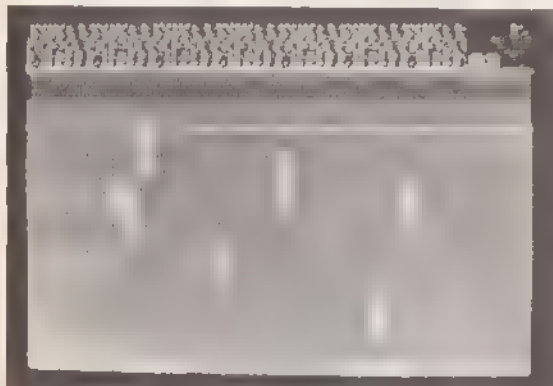
is the best I have seen on any Logo. So what was wrong with it?

The incompatibility with non-Acorn DFS systems, though this is not due to any malevolence on Acorn's part, is definitely a drawback.

The turtle graphics seem very slow even with the turtle hidden (and 50% slower again with the turtle visible). To draw a circle by *FDIRT!* takes about 40 seconds (no turtle) or 60 seconds (turtle visible).

My conclusion is the Acornsoft Logo is a good version of the language and a very powerful system. At £69 it's a bit steep though.

Boris Allan



producing a soccer game that puts blow football back in the dark ages where it belongs.

"Spectrum owners should be over the moon with this triumph as they watch the teams jog onto the turf, then marvel at the ball control of

ence between team colours wouldn't go amiss either.

"But if you're an armchair sportsman, this should keep you happy for hours.

John Minson



Reference

Program *Logo* **Micro** BBC/Electron **Price** £69.00 **Supplier** Acornsoft, 104 Hills Road, Cambridge.

In the next few months there promises to be a number of versions of Logo available on the BBC B.

The first version is from Acornsoft and comes on two Roms. It is worth noting that the Acornsoft version will also run on the Electron.

As well as the two Roms you get a reference card, and a disc and cassette of extensions and examples. There are also three manuals: an introduction, a reference manual, and a guide to the extensions and examples.

Acornsoft Logo is able to run using the disc filing sys-

tem, or the cassette filing system. The DFS has to be the Acorn version to be safe, because (like *Elite*) some of the disc commands expect perfectly defined behaviour.

Characters can be displayed on the graphics screen, and characters can be redefined, but there is no way in which a text-free screen can be produced. There has to be at least one line of text. This problem is somewhat ameliorated by a novel device to let you know in which drawing mode you happen to be (*Wrap*, *Fence*, or *Window*).

Depending on the mode, the border around the graphics screen alters so that you always know where you are. Acornsoft Logo also allows multiple turtles - similar to Tandy Color Logo.

It is possible to use *Local* variables, and the editing of

Somehow the idea has got out that only the Spectrum and Commodore versions of this game have graphics but here they are on the 484 as well - and fast colourful and atmospheric they are too, having been designed for Level 9 by a professional artist. However, as anyone who has played one of Pete Austin's adventures will be well aware, it is the richness of the text and the quality of the imagination behind the plot that makes the game stand out. *Eden* is a fine addition to their range, exploiting, with great humour and inventiveness, the theme

Conflict

Program *Return to Eden* **Micro** Amstrad CPC484 **Price** £9.95 **Supplier** Level 9 Computing, 229 Hughendon Road, High Wycombe, Bucks.

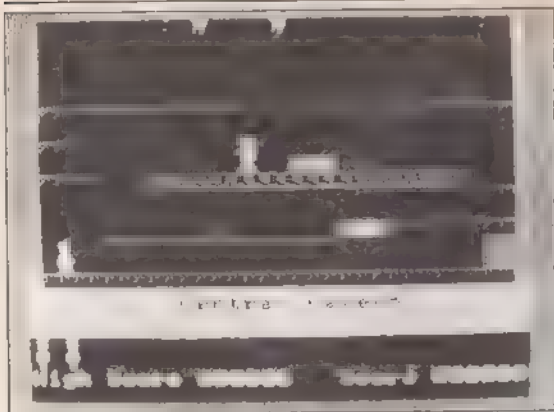
of the conflict between nature and the mechanical society, between intuition and cold logic, empathy and aggression. It is set on a world of the future, newly colonised in man's quest for the stars, and there is actually more than one level to the plot, when most adventures have difficulty scraping together the flimsiest excuse for just one storyline. Never has the term 'interactive fiction' been more appropriate.

The game is a direct follow up to, but can be played without experience of, *Snowball* but I was relieved that it has gone back to the format of only (only 171) 200+ locations rather than the brain-baffling 7000 of its predecessor.

With the arrival of this range, Amstrad owners already have the pick of the best text adventures.

Tony Kendle





A classic

Program *Manic Miner* **Micro** Amstrad CPC464 **Price** £8.95 **Supplier** Amaoft, Brentwood House, 169 Kings Road, Brentwood, Essex.

Yes, the one that started it all - the origin of the omnipresent jumping, dodging, treasure-collecting platform game has arrived on the 464. Not only that but it is an almost exact copy in every way imaginable. Software Projects, who have performed the conversion, have taken this approach on every machine it runs on and have managed a remarkable emulation of the Spectrum display in each case, with only some minor colour variations. Not everyone has regarded this as a good approach, claiming

that it ignores the special abilities of their micros but I feel the display still looks refreshingly different and atmospheric on computers like the CBM 64 or the 464. Anyway, all becomes irrelevant when you start playing, as you soon realise that not only was this the first, it is still in many ways the best, platform games. Delightfully, but not excessively, manic in the variety of monsters and problems you face, there is something about the game that clicks, even though it no longer has the awesome impact of its first release nor is as technically innovative as it once seemed.

For those who have upgraded from a Spectrum, it may not be worth buying again - for everyone else it is an essential classic.

Tony Kendle



White out

Program *Sky Ranger* **Price** £5.95 **Micro** Spectrum 48K **Supplier** Microsphere Computer Services Ltd, 72 Rosebery Road, London N10 2LA.

To be an Ace Sky-ranger, try flying a jetcopter among the skyscrapers, searching out robot Watchers, getting them centre screen and ... blasting them!

Microsphere have something of a reputation for producing novel games - witness *Skool Daze*. *Sky Ranger* is firmly within the 3D cockpit-view type shoot 'em up, but very well done and with several new touches.



It takes a while to master flying a jetcopter. Take off, accelerate, now a right turn ... No, misjudged it! Suddenly spinning round, down, but no loss of life - jetcopters are sturdy. The vidscreen has shattered, though, obscuring my view, making flying more difficult, and with only three more crashes before it's written off.

Gaining height helps but there's a further problem - a sea mist rolls in, forcing me down until I clear. Then

night time arrives and I'm running short of fuel. I must land exactly on a refuelling station.

At last - there's a Watcher! I fire and the screen whites out. Now to the radar to find the next one. Your control panel is convincing and keeps you

busy: the 3D graphics are so fast and smooth you'll be swaying in your chair.

If you want to blast things, being a Skyranger is a lot of fun.

John Minson



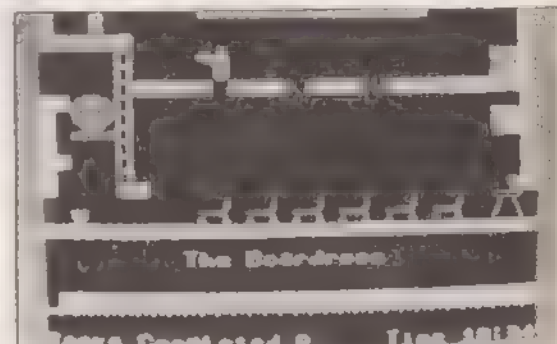
Suicidal

Program *Technician Ted* **Price** £5.95 **Micro** Spectrum 48K **Supplier** Hewson Consultants Ltd., Hewson House, 56b Milton Trading Estate, Milton, Abingdon, Oxon OX14 4RX.

Technician Ted has a case for a hearing by an industrial tribunal. Not only does his boss not tell him what to do but he doesn't even know the layout of the factory and he's constantly racing against time and the threat of the sack.

the smooth graphics and precise collision detection, and they certainly seem to have avoided the tendency to pre-judge death that mars some games. However, there are certain situations here which put you into an endlessly suicidal loop, until all of your copious number of lives are spent.

That said, at least there's a fair amount of humour about *Technician Ted*, with the huge heads of canteen ladies floating about in the cafeteria, and the boss himself booting Ted out into the street every time the lives run out. It will also take some time to discover



Or to put it another way, *Technician Ted* is yet another alliterative, multi-screen, avoid the objects, find the route, discover what to do and do it before time runs out, arcade adventure!

Hewson are boasting about

er quite what to do where.

Not a great game then and belongs to a type which is no longer fresh and exciting, but it is better than most.

John Minson



Frantic

Program *The Hellion* **Micro** Oriel/Atmos **Price** £5.95 **Supplier** Orpheus, The Smithy, Unit 1, Church Farm, Hatley St George, Sandy, Beds

Now this is the way to play shoot-em-up. A frantic trip through a universe of video-game characters and paraphernalia.

Boring? Tedious? Impossible? Not a bit. With simultaneous control of movement

and fire over the wasp-like Hellion, you shoot and dodge everything.

Each attacking wave has a different pattern of flight. Some hop about (rabbits, carrots), some fly in swirling formation (tiny bugs), whilst others roll or flip-flop across the screen in small groups. Even an amateur, like myself, can make progress as this program permits you to start the next game a couple of levels below the last one reached.

Vic Fielder



Play by numbers

Play your favourite tunes on your CBM 64 with a machine code routine by Simon Wallace

A major feature of the Commodore 64 is its high-quality, 3-voice, music synthesizer. If you have not been impressed by the music of computer games in the past, I suggest that you listen to the variations on the theme of *Greensleeves* which runs throughout Commodore's *Labyrinth* game. Another excellent composition is the title music for *Revenge of the Mutant Camels*. The User Manual (supplied with the CBM 64) demonstrates some simple tunes in Basic (see chapter 7). However, if you have ever tried to create a three-part tune, you will have found that Basic is too slow for good results.

The answer is this general-purpose, machine-code routine that can play any variety of tunes for you. There is no need for you to understand the routine itself; all you need to do is code your music using three simple instructions.

The Basic program listed in this article will load the machine-code routine that will play any 1, 2, or 3 part tune that you create. The data for your tune is loaded using Data statements. The values of the various control registers are set according to the User Manual. (Refer to chapter 7 and appendix P, but note the printing errors for Voice 2—Waveform should be 54283, and Sustain/Release should be 54285.)

You will have to set the Volume, Waveform, Attack, Decay, Sustain and Release. You could also set the SYNC, Ring Modulation, and Filter controls if you wish to be more ambitious! Finally, you set the address that your music code has been loaded in, and enter the machine code using the SYS command. The routine will play through your music until any key is pressed on the keyboard, or until the end of the tune. This makes the routine ideal for accompany-

ing the traditional 'DO YOU WANT TO PLAY AGAIN (Y/N)?' message. Ideally, you should choose a piece of music to suit the occasion—maybe a tune connected with the theme of your game or something appropriate to the players success (or lack of it).

Only three instructions are used to code tunes: The first type is used to control the pitch of a note and uses two bytes: The first byte indicates which voice is to be used. The second byte controls the pitch of the note. Values of 0 to 94 may be used. These represent each semitone between C- and A#-7. Appendix M of the User Manual lists these values, but, if you do not have a copy, you can write out and number each semitone. (Do not use the table in the Programmer's Reference Guide as this is numbered in a different way.)

The second type of instruction is a time delay. Any value above 4 will create a proportionate delay. The actual timings have not been measured, but 200 units to the bar is usually suitable for March Time. Thus, a whole note (crotchet) would be 100, a half note (quaver) 50, and a quarter note (semiquaver) 25. To set a delay of more than 255, follow one delay with another. By the way, everything slows down if you depress SHIFT-LOCK. It can be easier than changing your timings! Finally, a zero byte will cause the routine to return control to the Basic program.

Example - 1,48,2,52,3,55,100,1,60,2,64,3,67,100,0

Plays voice 1 with note 48 (C-4), plays voice 2 with note 52 (E-4), plays voice 3 with note 55 (G-4), waits for 100 units, plays voice 1 with note 60 (C-5), plays voice 2 with note 64 (E-5), plays voice 3 with note 67 (G-5), waits for 100 units, then ends tune.

Program Notes

10-39 Load code modules using foolproof checksum to verify typing mathematically calculate the internal high and low byte settings for the note table used by the machine code. This is to save you from having to type the values in. It also allows you to tune your CBM 64 to different keys by lowering the value 62887 in line 70. The value to use can be calculated using appendix M - decide which note is to be number 94, and calculate its Hi-Freq*256 + Low-Freq.

499-599 Set address of tune to be played and set Attack/Decay (AD), Sustain/Release (SR), and Waveform (WA) for each of the three voices. Also set any other special features.

700-800 POKEs in control information for machine code. Low and high addresses are stored in bytes 281 and 282. AD is held in 49822 to 49824. SR is held in 49825 to 49827. WA is held in 49828 to 49830. The routine also sets volume in 54296. The machine code at 49182 is entered using SYS.

1000-1120 DATA for machine code. Note that 49182 to 49331 is code. Also, 49332 to 49830 must not be used for any other purpose as this is used as workspace.

1610-2290 DATA for tune. Note that the loader routine requires that each module of code starts with its name as text and ends with a checksum. The first time you enter a new tune, make the checksum 999. The loader routine will then report what it should be. Also note that it is often best to break tunes into separate modules. These can then be connected together by the Basic program allowing repeats and changes of tone-control settings. The example program, is coded as an intro, the main eight bars, the middle eight bars, and a coda. The Basic program calls the main part three times separated by the middle part.

9980-9999 The final DATA must read DATA END.-1.

■ REM MACHINE CODE MUSIC VERSION 810-4

```
1 REM      BY SIMON WALLACE
2 REM
5 GOSUB 10 GOSUB 60 : GOTO 99
8 REM
9 REM MACHINE CODE LOADER
10 K=0 READ MH$ REMD 1 J=1 IF J=-1 THEN RETURN
15 PRINT "M",MH$," STARTS AT",J
20 K=K+1 : READ 1
30 IF 1<256 THEN POKE J,1 J=J+1 : GOTO 20
35 PRINT MH$," ENDS AT ",J-1
40 IF 1=K THEN 10
50 PRINT "CHECKSUM ERROR IN ROUTINE ",MH$
52 PRINT " ADDRESS ",J-1
54 PRINT " CALCULATED",J
56 PRINT " SHOULD BE ",1
58 STOP
59 REM
60 REM NOTE-TABLE LOADER
61 REM
70 FOR N=0 TO 94 : F=2*(N-94)/12*62567
80 FH=INT(F/256+9999) : FL=INT(F-256*FH)+5
85 POKE 49332+N,FL : POKE 49427+N,FH : NEXT N
```

```
90 RETURN
99 REM
499 REM
500 REM TUNE 4 - TAKE FIVE
510 ADD=50135
520 AD(1)=0 : SR(1)=249 : WA(1)=33
530 AD(2)=100 : SR(2)=185 : WA(2)=65
540 AD(3)=0 : SR(3)=250 : WA(3)=33
545 POKE54282,8
550 GOSUB700
551 ADD=50269 : GOSUB 786
553 ADD=50560 : GOSUB 786
555 ADD=50269 : GOSUB 786
557 ADD=50560 : GOSUB 786
559 ADD=50269 : GOSUB 786
559 ADD=50560 : GOSUB 786
560 FOR I=1 TO 3000 : NEXT I
599 REM
700 REM TUNE PLAYING ROUTINE
705 REM ADD IS ADDRESS OF TUNE
740 POKE 54296,15
750 FOR I=1 TO 3
760 POKE 49521+I,AD(I)
```

```

770 POKE 49524+I,SR(I)
780 POKE 49527+I,WA(I)
785 NEXT I
786 I=INT(ADD/255)
787 J=ADD-(I*255)
788 POKE 251,J : POKE 252,I
790 SYS 49152
795 REMPOKE 54296,0
800 RETURN
999 DATA "MACHINE CODE",49152
1000 DATA 169, 212, 133, 254, 162, 0, 161, 251, 208, 1, 96, 32, 161, 192
1010 DATA 170, 41, 252, 208, 72, 198, 202, 134, 2, 160, 0, 201, 2, 208
1020 DATA 2, 160, 7, 201, 3, 208, 2, 160, 14, 132, 253, 160, 4, 169
1030 DATA 0, 145, 253, 160, 0, 177, 251, 32, 161, 192, 170, 189, 180, 192
1040 DATA 145, 253, 189, 19, 193, 160, 1, 145, 253, 166, 2, 189, 114, 193
1050 DATA 160, 5, 145, 253, 189, 117, 193, 160, 6, 145, 253, 189, 120, 193
1060 DATA 160, 4, 145, 253, 76, 4, 192, 133, 164, 168, 162, 36, 32, 179
1070 DATA 192, 232, 208, 250, 132, 163, 32, 159, 255, 164, 163, 136, 208, 238
1080 DATA 162, 4, 160, 0, 32, 168, 192, 162, 11, 160, 1, 32, 168, 192
1090 DATA 162, 18, 160, 2, 32, 168, 192, 164, 164, 162, 146, 32, 179, 192
1100 DATA 232, 208, 250, 132, 163, 32, 159, 255, 164, 163, 136, 208, 238, 165
1110 DATA 138, 240, 1, 96, 76, 0, 192, 230, 251, 208, 2, 230, 252, 96
1120 DATA 134, 253, 185, 120, 193, 41, 254, 160, 0, 145, 253, 96, 74758
1610 DATA "EXAMPLE",INSTR(50,1)
1620 DATA 255,1,31,30,1,46,2,50,3,55,60
1630 DATA 1,43,30,1,46,2,50,3,55,60
1640 DATA 1,38,3,50,60,1,26,2,48,3,53,60
1650 DATA 1,31,30,1,46,2,50,3,55,60
1660 DATA 1,43,30,1,46,2,50,3,55,60
1670 DATA 1,26,2,48,3,53,60,1,26,2,48,3,53,60
1680 DATA 1,31,30,1,46,2,50,3,55,60
1690 DATA 1,43,30,1,46,2,50,3,55,60
1700 DATA 1,38,3,50,60,1,26,2,48,3,53,60
1710 DATA 1,31,30,1,46,2,50,3,55,60
1720 DATA 1,43,30,1,46,2,50,3,55,60
1730 DATA 1,38,3,50,60,1,26,2,48,3,53,60
1735 DATA 3,58,45,3,60,5,0,58616
1737 DATA "SECTION",INSTR(50,1)
1740 DATA 1,31,3,61,45
1750 DATA 2,58,3,62,15,3,61,45,3,60,15
1760 DATA 1,50,2,55,3,58,60,1,38,3,50,60
1770 DATA 1,26,2,48,3,53,60,1,31,3,55,60
1780 DATA 1,46,2,50,60,1,43,30,1,46,2,50,60
1790 DATA 1,38,3,57,10,3,58,10,3,57,10,3,55,30
1800 DATA 1,26,2,48,3,53,60,1,31,3,55,60
1810 DATA 1,46,2,50,60,1,43,30,1,46,2,50,60
1820 DATA 1,38,3,53,10,3,55,10,3,53,10,3,50,30
1830 DATA 1,26,2,45,3,48,60,1,31,3,50,30
1840 DATA 1,43,2,46,60,1,43,30,1,43,2,46,60
1850 DATA 1,38,3,50,45,3,55,15,1,26
1860 DATA 3,58,45,3,60,15,1,31,3,61,45
1870 DATA 2,58,3,62,15,3,61,45,3,60,15
1880 DATA 1,50,2,55,3,58,60,1,38,3,50,60
1890 DATA 1,26,2,48,3,53,60,1,31,3,55,60
1900 DATA 1,46,2,50,60,1,43,30,1,46,2,50,60
1910 DATA 1,38,3,57,10,3,58,10,3,57,10,3,55,30
1920 DATA 1,26,2,48,3,53,60,1,31,3,55,60
1930 DATA 1,46,2,50,60,1,43,30,1,46,2,50,60
1940 DATA 1,38,3,53,10,3,55,10,3,53,10,3,50,30
1950 DATA 1,26,2,45,3,48,60,1,31,3,50,30
1960 DATA 1,43,2,46,60,1,43,30,1,43,2,46,60
1970 DATA 1,38,2,50,60,1,26,2,48,2,53,50
1975 DATA 0,58510, "SECTION",INSTR(50,1),50560
1980 DATA 1,27,3,48,2,55,30,2,58,60
1990 DATA 2,55,30,1,31,2,51,60,1,33,3,45,2,48,45,2,50,15
2000 DATA 1,31,3,48,2,51,45,2,52,15
2010 DATA 1,26,3,45,2,53,30,2,57,60
2020 DATA 2,53,30,1,29,2,50,60
2030 DATA 1,31,3,43,2,46,45,2,48,15
2040 DATA 1,29,3,46,2,49,45,2,50,15
2050 DATA 1,24,3,46,2,51,30,2,55,60
2060 DATA 2,51,30,1,27,2,48,60
2070 DATA 1,29,2,45,45,2,46,15,1,27,2,48,45
2080 DATA 2,49,15,1,22,3,45,2,50,45
2090 DATA 2,49,15,2,50,45,2,51,15,1,22
2100 DATA 2,53,60,1,26,3,50,2,53,45
2110 DATA 2,52,15,1,29,2,53,45,2,54,15
2120 DATA 1,27,3,48,2,55,30,2,58,60
2130 DATA 2,55,30,1,31,2,51,60,1,33,3,45,2,48,45,2,50,15
2140 DATA 1,31,3,48,2,51,45,2,52,15
2150 DATA 1,26,3,45,2,53,30,2,57,60
2160 DATA 2,53,30,1,29,2,50,60
2170 DATA 1,31,3,43,2,46,45,2,48,15
2180 DATA 1,29,3,46,2,49,45,2,50,15
2190 DATA 1,24,3,46,2,51,30,2,55,60
2200 DATA 1,29,2,45,45,2,48,15,1,27
2210 DATA 3,43,2,53,45,2,51,15
2220 DATA 1,33,2,38,30,1,40,3,45,60
2230 DATA 3,55,30,1,52,3,57,60
2240 DATA 1,26,2,66,3,50,45,3,55,15
2250 DATA 1,30,3,58,45,3,60,5,0,58616
2260 DATA "EXAMPLE",INSTR(50,1),50858
2270 DATA 1,31,30,1,46,2,50,3,55,60
2280 DATA 1,43,30,1,46,2,50,3,55,60
2290 DATA 1,38,3,53,10,3,55,10,3,53,10
2300 DATA 3,50,30,1,26,2,45,3,48,60
2310 DATA 1,31,3,50,30,1,43,2,46,60
2320 DATA 1,43,30,1,43,2,46,60
2330 DATA 1,38,3,50,60,1,26,2,48,3,53,60
2340 DATA 1,31,30,1,46,2,50,3,55,60
2350 DATA 1,43,30,1,46,2,50,3,55,60
2360 DATA 1,38,3,53,10,3,55,10,3,53,10
2370 DATA 3,50,30,1,26,2,45,3,48,60
2380 DATA 1,31,3,50,30,1,43,2,46,60
2390 DATA 1,43,30,1,43,2,46,60
2400 DATA 1,38,3,50,60,1,26,2,48,3,53,60
2410 DATA 1,31,30,1,46,2,50,3,55,60
2420 DATA 1,43,30,1,46,2,50,3,55,60
2430 DATA 1,38,3,57,10,3,58,10,3,57,10
2440 DATA 3,55,30,1,26,2,48,3,53,60
2450 DATA 1,31,3,55,30,1,43,2,46,60
2460 DATA 1,43,30,1,43,2,46,60
2470 DATA 1,38,3,50,60,1,26,2,48,3,53,60
2480 DATA 1,31,30,1,46,2,50,3,55,60
2490 DATA 1,43,30,1,46,2,50,3,55,60
2500 DATA 1,38,3,50,60,1,26,2,48,3,53,60
2510 DATA 1,31,30,1,46,2,50,3,55,60
2520 DATA 1,43,30,1,46,2,50,3,55,60
2530 DATA 1,38,3,50,60,1,26,2,48,3,53,60
2540 DATA 1,31,2,46,3,55,120,0,59006
2550 DATA 9390 END,-1
9999 REM

```


A brief sketch

A short sketch-pad program for your artistic pleasure
written by Andrew Pritchard

This is a little Sketch Pad program for the Sinclair QL. The program has very simple but effective full screen drawing facilities, the results of which can be saved to microdrive to be used or modified later.

When run, the program gives a brief reminder of the special key functions and then asks for the name of the input screen file (if a screen is to be modified) and the name of the output screen file once it is complete. There are no checks

on the file names, so be careful.

The program controls are as follows: the arrow keys move the cursor, shown as "+", which thanks to the *Over - 1* command can go anywhere on the screen without interfering with the picture. *F1* switches the cursor to a paintbrush, that is, a trail of *ink* is left after moving the cursor. *F2* sets up a marker which is the start of any line drawn figure. *F3* plots from the marker or end of the last line to current cursor position.

F4 sets the cursor back to the *F2* designated marker. *F5* fills in the figure marked out by the plot commands. Finally, *Enter* saves the screen to the file named at initialisation. The numbers 0 to 8 specify the ink colour.

The *Easel* package can be used from SuperBasic to print screen dumps. What you have to do is this: reserve memory using the *Respr* function, reserving 4000 bytes, Load the *GPrint-Prt* file from the *Easel* cartridge into the reserved area using *Lbytes*, set up the screen to be dumped and then *Call* the routine using the address of the reserved memory area.

If your printer works with the *Easel Print* facility, then this method should work as well.

```
100 MODE 8:WINDOW 512,256,0,0:PAPER 0:INK 7:CLS #2
110 PRINT #2," Sketch Pad (c)1984 A.Pritchard"
120 PRINT #2,"Arrow keys control cursor"
130 PRINT #2,"F1 = cursor or paintbrush"
140 PRINT #2,"F2 = set marker"
150 PRINT #2,"F3 = plot line to cursor"
160 PRINT #2,"F4 = move cursor to marker"
170 PRINT #2,"F5 = Fill in figure"
180 PRINT #2,"ENTER = save screen to named file"
190 PRINT #2,"0 to 8 = colour control"
200 INPUT #2,"Input screen file ? "
210 INPUT #2,"Output screen file ? "
220 IF AS="" THEN CLS:ELSE LBYTES AS,131072
230 DIM G$(50),GY$(50)
240 P=7:X=50:Y=50:C=1:TYPE=-1:REMEMBER
250 OVER -1
260 REPEAT IN
270 CURSOR X,Y,0,0:PRINT "+":IS=INKEY$(-1)
280 CURSOR X,Y,0,0
290 IF TYPE=-1 THEN PRINT "+":ELSE PRINT " "
300 IC=CODE$(IS):IF IC=192 THEN X=X-1:NEXT IN
310 IF IC=200 THEN X=X+1:NEXT IN
320 IF IC=208 THEN Y=Y+1:NEXT IN
330 IF IC=216 THEN Y=Y-1:NEXT IN
340 IF IC=232 THEN CHANGETYPE
350 IF IC=236 THEN BEEP 150,40:C=1:REMEMBER
360 IF IC=240 THEN PLOT
370 IF IC=244 THEN X=GX(1)-1.5:Y=GY(1)+2
380 IF IC=248 THEN FILLIN
390 IF IC=10 THEN SBYTES BS,131072,32768
400 IF IC<48 OR IC>56 THEN NEXT IN
410 P=IC-48:IF IC=56 THEN P=226
420 PAPER P:OVER 0
430 CURSOR X,Y,0,0
440 PRINT " ":OVER TYPE
450 END REPEAT IN
460 :
470 DEFINE PROCEDURE FILLIN
480 OVER 0:INK P:FILL 1
490 FOR I=2 TO 50
500 LINE G$(I-1),GY(I-1) TO G$(I),GY(I)
510 END FOR
520 FILL 0:INK 7:OVER TYPE
530 END DEFINE
540 :
550 DEFINE PROCEDURE PLOT
560 OVER 0:INK P
570 C=C+1:IF C>DIMN(GX) THEN C=1:REMEMBER:RETURN
580 REMEMBER:LINE G$(C-1),GY(C-1) TO G$(C),GY(C)
590 INK 7:OVER TYPE
600 END DEFINE
610 :
620 DEFINE PROCEDURE CHANGETYPE
630 IF TYPE=0 THEN TYPE=-1:ELSE TYPE=0
640 OVER TYPE
650 END DEFINE
660 :
670 DEFINE PROCEDURE REMEMBER
680 GX(C)=X+1.5:GY(C)=Y-2
690 END DEFINE
```

Experienced machine code programmer wanted for immediate project.
Translation of Commodore 64 6502. Code to Spectrum Z80.
This is a permanent position. Salary commensurate with experience.

Please contact:
 Jon Baldachin
 LEISURE GENIUS

3 Montagu Row, London W1H 1AB
 Telephone 01-935 4622



UPPER GUMTREE

You will be!



HISOFT ULTRAKIT £9.45

The most powerful toolkit yet for ZX BASIC. All the features you will ever need; AUTO Insert, full RENUMBER, block DELETE, CLOCK, ALARM, error trapping, break trapping, full TRACE with single-step and much, much more. Makes ZX BASIC easy-to-use and powerful.

DEV PAC £14

An excellent assembler, an advanced line-editor, a comprehensive disassembler and a superb 'front panel' debugger all in one package. Used by many leading software houses to write their games. "Buy It!" Adam Denning 1984.

PASCAL £25

A powerful and almost full implementation of Pascal - not a Tiny Pascal. A valuable educational and development tool, programs typically run 40 times faster than a BASIC equivalent. Spectrum version includes Turtle Graphics package. "I haven't seen any other compiler that could match Hisoft's Pascal".

All prices, UK delivered, relate to 48K ZX Spectrum versions.



HISOFT

180 High Street North
 Dunstable, Beds. LU5 1AT
 Tel: (0582) 696421



HISOFT

presents

FONT 464

for the

AMSTRAD CPC 464

FONT 464 is a font designer and character generator especially developed for the CPC 464 microcomputer.

Design your own character fonts and graphic symbols with this very friendly and powerful package.

FONT 464 allows you to create a new design or amend an existing one using set, reset, invert, reflect, rotate, inverse and even animation!

Load and save character sets to/from tape, use the new character(s) from BASIC, design your own animated graphics - all this and more with **FONT 464**.

FONT 464 is supplied with three interesting and amusing character sets for you to experiment with.

★ All this power for: £7.95 inclusive ★

We also have available for the Amstrad CPC 464:

Hisoft Devpac - our full Z80 assembler and disassembler/debugger with more features than you'll ever need.

Hisoft Pascal - a virtually full implementation of Standard Pascal. Compiles and executes incredibly quickly.

Please write to Hisoft for more details of Pascal and Devpac on the CPC 464 or contact Amsoft with your order.

The key to it all

Turn your BBC B into a polyphonic music machine with the help of Ian Waugh

The introduction of sound chips into personal computers brought about the birth of a totally new musical instrument - the computer itself. How easy and effective it is to play depends both upon the hardware and the software used to drive it. The BBC micro excels in both departments and we can use it to perform some quite complex musical feats.

Most musical instruments are designed to be ergonomically easy to play - within the confines of the shape required by the instrument to produce whatever sound it is supposed to produce. A piano-type keyboard is probably one of the best examples, although designs exist for other keyboards which are intended to be easier to play.

Computers, unless they are specifically designed to operate as a musical instrument, are not normally supplied with a musical keyboard and if we want to play the computer we must make do with what we have, ie, the Qwerty type-writer keyboard.

Depending upon your musical upbringing, you may find this easy or difficult to adapt to. The Qwerty keys are not laid out like a piano keyboard and are not labelled to correspond to musical notes. It may well be that here the non-musician has a distinct advantage over the keyboard player.

If you can play a piano keyboard your playing will tend to be partly automatic

proves their skill in using the Qwerty keyboard as a musical instrument but it will still be difficult to play anything of any technical difficulty. We can, however, still have a lot of fun using the computer in this way.

The program shown listed here converts your BBC B keyboard into a 3-note polyphonic synthesiser, with controls as shown below. Function keys 11 to 14 will put the keyboard under the control of that envelope number.

Program Notes

There is more than one way in which this program could have been written. One way, the brute force method, would be to include 26 lines such as:

```
390 IF Keys Pressed > EndProcElse IF Inkey (-17)
```

```
Note = 33:PROCsound:KeysPressed - Keyspressed + 1
```

At least such a method would be quite easy to understand. A more sophisticated method is also doubtless possible but at the expense of comprehension. This program tries to tread a middle path. Once you understand the principles involved you can experiment and write your own - as simple or as sophisticated as you wish. To minimise the time taken by the program to interpret the Basic code, integer variables and short variable names have been used.

The way the program works is described first, followed by individual sections and aspects.

We have substituted the 26 possible lines mentioned above by an array, KBoard%, which contains the negative Inkey values of the keys we want the program to respond to. A second array, KFlag%, keeps track of whether a key is currently pressed or not. The array, CH%, keeps track of which channel is being used to produce which note.

Pitch% sets the basic root pitch and E% is the envelope number.

The Repeat loop between Lines 370 and 410 cycles through the 26 negative Inkey values in the KBoard% array. The KFlag% array checks to see if there has been any change in keys pressed since the last loop and if there has the program is diverted to Proc.

N% refers to how far up the scale we are. If N% equals 23, 24, 25 or 26, one of the function keys is being pressed and the program is diverted to Proc which simply sets E% to a new envelope number. If N% is less than 23 it means a note is required.

As we can't sound more than three notes at once, the program checks, in Line 460, to see how many keys are currently pressed. If there are already three keys down and another key has been pressed, control is immediately passed back to the Repeat loop.

If control gets to Line 480, there is an empty channel and a key has been pressed telling the program to make a sound. Chan% is incremented by 1 until it finds an empty channel. This is given the value of N% which tells the program which key enabled that particular channel and it plays a sound of the required pitch. KPressed% is also incremented to keep track of how many keys are down. Lastly, the KFlag% variable is changed in Line 500. If KFlag%(N%) was TRUE, ie, pressed down, it is set to FALSE. The next time the loop looks at this value of N% in Line 390 it will be looking to see if the key has been lifted.

If a key has been lifted, control passes to Line 490 instead of 480. Chan% is incremented until the program finds which channel was responsible for the sound produced by the key which has just been lifted. When the channel has been found, it is flushed. Notice the use of the dummy note parameter to allow the release phase to occur. KPressed% is decremented to show that a sound channel has been freed. KFlag%(N%) is changed again by Line 500 to TRUE.

The use of KFlag% ensures that a channel is not given a sound request until the key responsible for the present sound on that channel is lifted. This prevents a stream of continuous information going to the sound channels as in the monophonic program, and it permits envelope control.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 3 | | 5 | 6 | | 8 | 9 | 0 | | ^ | ~ | |
| Q | W | E | R | T | Y | U | I | O | P | @ | [| - |

and, after a little practice, your fingers know how to move in order to play a certain sequence of notes. Much the same applies to the typist who is used to the Qwerty keyboard, but in this case the fingers are responding to different patterns, ie, word patterns, not musical ones.

Musicians and non-musicians alike will find that a little practice greatly im-

```
10 REM PROGRAM B.3
20 REM 3-Note Polyphonic
30 REM Keyboard (Q - )
40 REM From G (Pitch=81)
50 REM To E (Pitch=165)
60
70 DIM KBoard%(26)
80 DIM KFlag%(26)
90 DIM CH%(3)
100
110 FOR Channel=1 TO 3
120 CH%(Channel)=0
130 NEXT Channel
140
150 FOR Keys=1 TO 26
```

```
160 READ Data
170 KBoard%(Keys)=Data
180 KFlag%(Keys)=-1
190 NEXT Keys
200
210 DATA 17,50,34,18,35,52,28,36,53
220 DATA 69,54,22,38,39,55,40,56,72
230 DATA 25,57,121,41,114,115,116,21
240
250 REM f1=ENVELOPE1:f2=ENVELOPE2
260 REM f3=ENVELOPE3:f4=ENVELOPE4
270
280 ENVELOPE1,1,0,0,0,0,0,126,-4,-4,-4,126,100
```

```

290 ENVELOPE2,129,12,0,-4,1,0,3,126,-1
,0,-4,126,100
300 ENVELOPE3,1,0,1,-1,0,1,1,126,-1,0,
-4,126,100
310 ENVELOPE4,8,0,0,0,0,0,0,63,10,0,-6
3,63,126
320
330 Pitch%=77
340 E%=2
350
360 KPressed%=0
370 REPEAT
380 FOR N%=1 TO 26
390 IF INKEY(=KBoard$(N%))=KFlag%(N%
PROC
400 NEXT N%
410 UNTIL FALSE
420 END
430

```

```

440 DEF PROC
450 IF NX>22 PROC=ENDPROC
460 IF KPressed%=3 AND KFlag%(NX) END
800
470 Chan%=0
480 IF KFlag%(NX) REPEAT Chan%=Chan%+1
:UNTIL CH$(Chan%)=0:CH$(Chan%)=N%:SOUND%
:0-Chan%,E%,Pitch%*N%+4,255:KPressed%=K
Pressed%+1
490 IF NOT KFlag%(NX) REPEAT Chan%=Cha
n%+1:UNTIL CH$(Chan%)=0:CH$(Chan%)=0:SO
UND%:0:Chan%,3,0,0:KPressed%=KPressed%
+1
500 KFlag%(NX)=NOT KFlag%(NX)
510 ENDP
520
530 DEF PROC
540 EX=N% 22
550 ENDP

```

The sound command in Line 480 which produces the sound has been given an indefinite duration. If the AS phase of the envelope is 0, the note will continue until you take your finger off the key. The channel will then be flushed the next time around the loop by Line 490.

The use of KPressed% in Line 460 to terminate the procedure if too many keys are down can be altered. As it is, if three keys are down and you press another, control just passes back to the Repeat loop. Some synthesisers have a high, a low or a last note priority which means that the three highest, lowest or the three last notes take precedence over any others. You can achieve this by altering the '3 keys down' criteria in this line.

If you want to try some dazzling fingerwork, you may find the response a little slow; and you may notice a very small time lag between the notes of a chord if you press three keys exactly together. You will see that the program does not attempt to synchronize any notes. This is a result of the program design and the fact that each note has to run through a lot of Basic programming before it is heard. This is not likely to be a problem but you can cut the response time by compressing the coding.

As a modification, if you wanted to synchronize the notes, instead of calling Proc with every note pressed you could call a ProcGetnotes to count the keys pressed, and work out the pitch values. At the end of the For...Next

loop you could call a ProcPlay which would carry out the information gathered by ProcGetnotes and synchronize the notes if necessary.

You can add more commands via the negative Inkey function. These can be used to increase the range of the keyboard and to access more envelopes. Detection of, say, the Shift key could increase the pitch by an octave. Include the relevant key numbers (User Guide page 275) in the Data statements following Line 230. The arrays, initiating loops and the repeating For...Next loop will need to be altered, too.

This is an edited extract from Ian Waugh's book *Making music on the BBC computer* published by Sunshine Books at £5.95.

COMPUTER CONNECTIONS

WE ARE CURRENTLY SCOURING THE COUNTRY FOR TOP QUALITY PROGRAMS TO MARKET WITHIN THE SOFTWARE INDUSTRY STOP

PROGRAMS MUST BE OF A HIGH STANDARD, PRODUCED IN MACHINE CODE AND SHOULD CONTAIN GOOD GRAPHICS AND SOUND. ONLY ORIGINAL AND INNOVATIVE WORK FOR THE MOST POPULAR MACHINES WILL BE CONSIDERED STOP

WE HAVE NUMEROUS CONTACTS THROUGHOUT THE SOFTWARE INDUSTRY AND OUR EXPERTISE IN NEGOTIATING FOR CONTRACTS ENSURE THAT ALL OUR PROGRAMMERS RECEIVE THE OPTIMUM TERMS THAT CAN BE FORMULATED STOP

WE HAVE EXPERIENCED EVALUATORS WHO CAN ADVISE YOU HOW TO TRANSFORM AN ADEQUATE PROGRAM INTO A BLOCKBUSTER STOP

IN MOST INSTANCES WE ARE ABLE TO SECURE BETTER TERMS FOR PROGRAMS THAN AN INDEPENDENT AUTHOR STOP

WE ARE ABLE TO SUPPLY STEADY CONVERSION WORK OF TOP SELLING GAMES TO COMPETENT MACHINE CODE PROGRAMMERS. REMUNERATION FOR COMPLETED PROGRAMS IS SUBSTANTIAL FOR THE AMOUNT OF WORK INVOLVED STOP

All submissions should be securely packaged and addressed to:-
COMPUTER CONNECTIONS, FREEPOST, BLACKBURN BB1 8BR.

COMPUTER CONNECTIONS

CONNECTING YOU WITH TOMORROWS WORLD TODAY

DISCOUNT SOFTWARE

| DESCRIPTION | R.P.P. | OUR PRICE | DESCRIPTION | R.P.P. | OUR PRICE | DESCRIPTION | R.P.P. | OUR PRICE | | | |
|--------------------|--------|-----------|------------------|--------|-----------|---------------|--------|-----------|---------------------|-------|-------|
| SHENOL DOOLHOLMES | 4.95 | 39.45 | NIGHTLY LIFE | 6.95 | 7.95 | MARK NUMBER | 1.95 | 9.95 | SHIRLEY GORM HEMES | 14.95 | 10.45 |
| SPACE SHUTTLE | 1.95 | 5.25 | JOYFUL TRULIES | 1.95 | 7.95 | As I SEE YOU | 1.95 | 9.95 | SUNSHINE EXPRESS | 1.95 | 8.95 |
| ZOMBIE ZOMBIE | 2.95 | 5.25 | LOVER OF DESPAIR | 6.95 | 6.25 | VALERIE'S | 9.95 | 1.95 | BYAMARRA | 1.95 | 5.00 |
| YANT PUMPER | 5.95 | 5.25 | LOVER OF DESPAIR | 6.95 | 6.25 | VALERIE'S | 9.95 | 1.95 | SELECT | 1.95 | 9.00 |
| FALL GUY | 4.95 | 5.25 | CYCLONE | 4.95 | 4.25 | LET'S GO | 7.95 | 4.25 | GO TO THE SISTERS | 1.95 | 10.95 |
| STAR STRIKE | 4.95 | 4.50 | UNDERMATH | 1.95 | 2.25 | 20 GRAND PRIZ | 8.95 | 5.25 | FIGHTER PILOT 6A | 0.95 | 7.45 |
| FOR WOLF | 4.95 | 5.25 | THE 1 | 5.95 | 4.25 | THE 1 | 4.75 | 5.25 | CADYMAN WARRIOR | 9.95 | 10.95 |
| SKY RANGER | 6.95 | 5.25 | FLY IN THE WATER | 4.95 | 7.25 | THE 1 | 6.75 | 5.25 | WHITE LIGHT WARRIOR | 9.95 | 10.95 |
| SON OF A BLUNDER | 0.95 | 5.25 | FLY FROM THE | 4.95 | 7.25 | THE 1 | 6.75 | 5.25 | COMBAT LYNN | 9.95 | 10.95 |
| YASAMA | 5.95 | 5.25 | THE 1 | 4.95 | 7.25 | THE 1 | 6.75 | 5.25 | HUNG HANG | 7.95 | 8.95 |
| DAILY DECADE THE | 5.95 | 5.95 | THE 1 | 4.95 | 7.25 | THE 1 | 6.75 | 5.25 | KUNG FU FRAMES BACK | 1.95 | 10.95 |
| DARK STAR | 1.95 | 4.95 | THE 1 | 4.95 | 7.25 | THE 1 | 6.75 | 5.25 | THE 1 | 7.95 | 8.95 |
| THE MAN | 7.95 | 5.95 | THE 1 | 4.95 | 7.25 | THE 1 | 6.75 | 5.25 | THE 1 | 7.95 | 8.95 |
| ALL LEVEL 3 GAMES | 7.95 | 5.95 | THE 1 | 4.95 | 7.25 | THE 1 | 6.75 | 5.25 | THE 1 | 7.95 | 8.95 |
| LOUCH OF MIDWINTER | 0.95 | 5.95 | THE 1 | 4.95 | 7.25 | THE 1 | 6.75 | 5.25 | THE 1 | 7.95 | 8.95 |
| OGDARDY'S NEW | 1.95 | 5.95 | THE 1 | 4.95 | 7.25 | THE 1 | 6.75 | 5.25 | THE 1 | 7.95 | 8.95 |
| CONQUEST OF THE | 6.95 | 5.95 | THE 1 | 4.95 | 7.25 | THE 1 | 6.75 | 5.25 | THE 1 | 7.95 | 8.95 |
| BATTLE CARS | 1.95 | 5.95 | THE 1 | 4.95 | 7.25 | THE 1 | 6.75 | 5.25 | THE 1 | 7.95 | 8.95 |
| D-DAY | 1.95 | 5.95 | THE 1 | 4.95 | 7.25 | THE 1 | 6.75 | 5.25 | THE 1 | 7.95 | 8.95 |
| THE 1 | 1.95 | 5.95 | THE 1 | 4.95 | 7.25 | THE 1 | 6.75 | 5.25 | THE 1 | 7.95 | 8.95 |
| BLACKPACERS | 1.95 | 5.95 | THE 1 | 4.95 | 7.25 | THE 1 | 6.75 | 5.25 | THE 1 | 7.95 | 8.95 |
| WHITE (REHINING) | 1.95 | 5.95 | THE 1 | 4.95 | 7.25 | THE 1 | 6.75 | 5.25 | THE 1 | 7.95 | 8.95 |
| SELECT | 1.95 | 5.95 | THE 1 | 4.95 | 7.25 | THE 1 | 6.75 | 5.25 | THE 1 | 7.95 | 8.95 |
| POTTY PIGEON | 1.95 | 5.95 | THE 1 | 4.95 | 7.25 | THE 1 | 6.75 | 5.25 | THE 1 | 7.95 | 8.95 |
| LIVE DAVE SNOOKER | 1.95 | 5.95 | THE 1 | 4.95 | 7.25 | THE 1 | 6.75 | 5.25 | THE 1 | 7.95 | 8.95 |
| THE 1 | 1.95 | 5.95 | THE 1 | 4.95 | 7.25 | THE 1 | 6.75 | 5.25 | THE 1 | 7.95 | 8.95 |
| STEVE PAVONI (1) | 1.95 | 5.95 | THE 1 | 4.95 | 7.25 | THE 1 | 6.75 | 5.25 | THE 1 | 7.95 | 8.95 |

ALL PRICES INCLUDE 48 HOURS DELIVERY**

Please make cheques payable to Don Knight and send in S.O.F.T. PAYMENT PO BOX 106800 BOSTON MA 02116

1-800-368-8878

THE MEGASAVE *FANTASTIC SAVINGS*

[illegible]

SUNARO

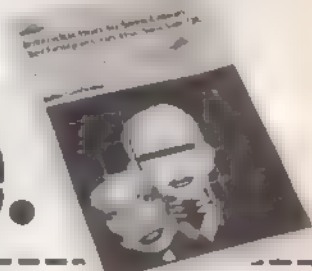
| COMPUTERS | | SPECTRUM | | C64/64C | |
|------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Cost | £125.50 | £125.50 | £125.50 | £125.50 | £125.50 |
| Size | 175 x 100 x 100 | 175 x 100 x 100 | 175 x 100 x 100 | 175 x 100 x 100 | 175 x 100 x 100 |
| Weight | 1.50 kg | 1.50 kg | 1.50 kg | 1.50 kg | 1.50 kg |
| Power | 100 W | 100 W | 100 W | 100 W | 100 W |
| Features | 100 W | 100 W | 100 W | 100 W | 100 W |
| Accessories | 100 W | 100 W | 100 W | 100 W | 100 W |
| Warranty | 100 W | 100 W | 100 W | 100 W | 100 W |
| Support | 100 W | 100 W | 100 W | 100 W | 100 W |
| Reliability | 100 W | 100 W | 100 W | 100 W | 100 W |
| Performance | 100 W | 100 W | 100 W | 100 W | 100 W |
| Expandability | 100 W | 100 W | 100 W | 100 W | 100 W |
| Connectivity | 100 W | 100 W | 100 W | 100 W | 100 W |
| Storage | 100 W | 100 W | 100 W | 100 W | 100 W |
| Networking | 100 W | 100 W | 100 W | 100 W | 100 W |
| Security | 100 W | 100 W | 100 W | 100 W | 100 W |
| Compliance | 100 W | 100 W | 100 W | 100 W | 100 W |
| Documentation | 100 W | 100 W | 100 W | 100 W | 100 W |
| Customer Service | 100 W | 100 W | 100 W | 100 W | 100 W |
| Overall Rating | 100 W | 100 W | 100 W | 100 W | 100 W |

Assimilate. And Stimulate.

From Sunshine, a book all about simulation techniques on Sinclair's new QL, written with the unique benefit of actual QL experience. Many entertaining, intriguing chapters explain how you can get your QL to output what you need, to help your hobby, your business – or your curiosity. Inside, you'll find how to develop the ability to fully analyse problems and confidently develop your own simulations. And you'll be able to stretch the potential of your new QL to the limits.

Using our modelling techniques you can create an economic model, or a flight simulator. You can engineer a more efficient engine, or manage a project better. All on your QL, with the help of this vital new book. **An Introduction to Simulation Techniques on the Sinclair QL.**

Order today, using the coupon or from your local bookshop or computer dealer.



Please send me the Introduction
to Simulation Techniques on the
Sinclair QL at £6.95 ISBN 0 946408 45 9

- ☐ I enclose a cheque for £ _____ payable to Sunshine Books.
- ☐ I enclose a postal order for £ _____ payable to Sunshine Books.
- ☐ Please charge my Visa/Access card No. _____ valid from _____ expires end: _____

Signed: _____
Name: _____
Address: _____

Send to: Sunshine Books,
12/13 Little Newport Street, London WC2R 3LD.

Look out for the Sunshine range in W.H. Smith's, Boots, John Menzies, other leading retail chains and all good bookshops. Dealer enquiries: 01-437 4343.

Moving staircase

Gordon McQueen explains how to produce a flicker free graphic display on the Dragon 32

One of the most useful features of the Dragons graphics capabilities is the ability to draw on one graphics screen while displaying another. This feature allows flicker free graphics displays; however it uses up twice the normal number of graphics pages for each Pmode, eg, to animate a Pmode 0 display two graphic pages are required, eight pages are required for a Pmode 4 display. Listed here are two programs which make use of this feature.

Program One draws two large spheres with a row of smaller spheres to one side of them on the first set of four graphics pages and the same display on the second set of four graphics pages with the colours in different positions. When the program is run the effect is quite impressive as the large spheres appear to rotate and the small spheres appear at the top of the screen.

This effect is obtained by displaying one graphics display followed by the other using the Pmode command and the Screen command. When the Pmode command is used it requires two parameters which are the graphics mode and the starting page of the graphics screen. If the starting page is changed in a program line then no effect can be seen until the Screen command is used. This

routine is between Lines 430 and 480.

Program two draws a well known optical illusion, a staircase that constantly goes down or up depending upon which way you follow it. The animations in this program is a ball which bounces down the staircase, the Get and Put commands are used along with the Or option to draw the ball.

The arrays used are Ball to store the drawing of the ball, S1 and S2 are used to store parts of the staircase that are overwritten by the ball.

The drawing of the staircase is repeated twice, once for each screen instead of using the Pcopy command as for some strange reason if you Pcopy 4 to 0 your program sometimes crashes and returns you to command level.

The screen changing in this program to produce the animation is accomplished between Lines 970 and 1040. The direction of the ball is controlled in Lines 1050 and 1060 and the bouncing effect is produced in Line 1090 by adding a sine wave of amplitude 10 pixels to the Y coordinate of the balls position.

This routine will enable Dragon users to produce flicker free graphics even on a large scale as in Program 1. (Note however due to a Rom bug the first time you run either program you may get a Sn error due to the Pclear statement.)

Listing 1

```

20 PCLSR 0
30 PMODE:1
40 C1=3:0C42
40 PCLSR 0
50 SCREEN:0
60 CIRCLE(110,100),2,1
70 CIRCLE(145,34),2,1
80 PRINT(145,34),1,1
90 CIRCLE(175,70),11,1
100 PRINT(175,70),1,1
110 CIRCLE(180,120),20,1
120 PRINT(180,120),1,1
130 CIRCLE(150,190),35,1
140 PRINT(150,190),1,1
150 GOSUB 170
160 PUT 260
170 DEF FN E(X)=X/42,1
180 CIRCLE(X,42),27,1,1,7
190 CIRCLE(70,140),50,1
200 CIRCLE(70,140),30,1,1,7
210 PRINT(70,140),02,1
220 PRINT(50,42),02,1
230 PRINT(20,42),01,1
240 PRINT(30,140),01,1
250 PRINT(60,42),01,1
260 PRINT(110,140),01,1
270 RETURN
280 PMODE:3,5
290 PCLSR 0
300 SCREEN:0
310 C=C1 C1=C2 C2=C1
320 CIRCLE(100,1),1,1
330 CIRCLE(130,20),4,1
340 PRINT(130,20),1,1
350 CIRCLE(160,45),8,1
360 PRINT(160,45),1,1
370 CIRCLE(185,100),15,1
380 PRINT(185,100),1,1
390 CIRCLE(170,160),25,1
400 PRINT(170,160),1,1
410 GOSUB 170
420 PM=1
430 PMODE:3,PM
440 SCREEN:0
450 FOR T=1030 NEXT T
460 PM=PM+4
470 IF PM=9 THEN PM=1
480 GOTO 430

```

Listing 2

```

10 PCLSR 0
20 PMODE:1
30 C1=3:0C42
40 PCLSR 0
50 SCREEN:0
60 CIRCLE(110,100),2,1
70 CIRCLE(145,34),2,1
80 PRINT(145,34),1,1
90 CIRCLE(175,70),11,1
100 PRINT(175,70),1,1
110 CIRCLE(180,120),20,1
120 PRINT(180,120),1,1
130 CIRCLE(150,190),35,1
140 PRINT(150,190),1,1
150 GOSUB 170
160 PUT 260
170 DEF FN E(X)=X/42,1
180 CIRCLE(X,42),27,1,1,7
190 CIRCLE(70,140),50,1
200 CIRCLE(70,140),30,1,1,7
210 PRINT(70,140),02,1
220 PRINT(50,42),02,1
230 PRINT(20,42),01,1
240 PRINT(30,140),01,1
250 PRINT(60,42),01,1
260 PRINT(110,140),01,1
270 RETURN
280 PMODE:3,5
290 PCLSR 0
300 SCREEN:0
310 C=C1 C1=C2 C2=C1
320 CIRCLE(100,1),1,1
330 CIRCLE(130,20),4,1
340 PRINT(130,20),1,1
350 CIRCLE(160,45),8,1
360 PRINT(160,45),1,1
370 CIRCLE(185,100),15,1
380 PRINT(185,100),1,1
390 CIRCLE(170,160),25,1
400 PRINT(170,160),1,1
410 GOSUB 170
420 PM=1
430 PMODE:3,PM
440 SCREEN:0
450 FOR T=1030 NEXT T
460 PM=PM+4
470 IF PM=9 THEN PM=1
480 GOTO 430

```

```

500 IF A=5 THEN Y=Y+12:GOTO 530
510 Y=Y-16
520 LINE(X,Y)-PSET
530 NEXT
540 X=X+20
550 Y=Y+8
560 FOR A=1 TO 3
570 LINE(X,Y)-(X+20,Y-12) PSET
580 X=X+20
590 IF A=3 THEN Y=Y-12:GOTO 620
600 Y=Y-16
610 LINE(X,Y)-PSET
620 LINE(X,Y)-(X+20,Y-12) PSET
630 IF A=3 THEN LINE(X+20,Y-12)-(X,Y+4) PSET
640 NEXT
650 X=X-4
660 FOR A=2 TO 7
670 LINE(X,Y)-(X-20,Y-16) PSET
680 LINE(X,Y)-(X+20,Y-12) PSET
690 LINE(X,Y)-(X,Y-4) PSET
700 X=X-20:Y=Y+8
710 NEXT
720 FOR F=1 TO 7
730 LINE(X+20,Y-16)-(X,Y+4) PSET
740 LINE(X+20,Y-16)-(X+40,Y-4) PSET
750 DRAW"BM"+STR$(X+20)+","+STR$(Y-4)+":
760 X=X+20:Y=Y+8
770 NEXT
780 FOR A=1 TO 3
790 LINE(X+20,Y-16)-(X,Y+4) PSET
800 LINE(X+20,Y-16)-(X+40,Y-4) PSET
810 LINE(X+20,Y-20)-(X+40,Y-16) PSET
820 IF A=1 THEN LINE(X+20,Y-20)-(X+20,Y-16) PSET
830 X=X+20:Y=Y-16
840 PRINT(110,Y),5,5
850 NEXT
860 LINE(180,95)-(180,121) PSET
870 LINE(180,154)-(180,181) PSET
880 LINE(10,95)-(10,121) PSET
890 LINE(150,65)-(150,121) PSET
900 PRINT(20,120),5,5
910 PRINT(160,90),5,5

```


GAMESMANSHIP

| | | | | | |
|-------------------|-------|-------------------|--------|----------------|-------|
| AMSTRAD | | C16 | | VIC 20 | |
| Football Manager | £6.75 | Gamecock I | £4.99 | Cherish Peter | £5.90 |
| Biggorr | £6.75 | Gamecock II | £4.99 | Paras of Willy | £4.99 |
| Test Master | £6.99 | Highball 737 | £5.99 | Mindbogg | £4.99 |
| Man - Minor | £7.50 | Scambee | £5.99 | Do Do Lairs | £4.99 |
| Pyramarama | £7.99 | Porti | £5.99 | Las Vegas | £4.99 |
| H. John | £8.99 | Solarans | £5.99 | | |
| Highball 737 | £5.99 | Flight 015 | £5.99 | | |
| Johny Fisher | £6.75 | | | | |
| Johnny Fies | £6.75 | BBC | | | |
| Palindrom Diamond | £6.75 | Constitution | £5.99 | | |
| Redcaps | £5.99 | Scrabble | £12.99 | | |
| Any Roland Rat | | Redcoats | £5.99 | | |
| Games | £7.50 | Football Manager | £7.75 | | |
| | | Chucki Egg | £7.75 | | |
| | | Johnny Rac | £5.99 | | |
| | | Block Bustlers | £5.75 | | |
| | | BBG Interface | £15.99 | | |
| | | | | | |
| | | ELECTRON | | | |
| | | Hunchback | £5.85 | | |
| | | Idem Basic | £12.75 | | |
| | | Block Bustlers | £5.75 | | |
| | | Palindrom Diamond | £6.75 | | |
| | | Redcaps | £5.99 | | |
| | | Electronic Face | £15.99 | | |

SAE for full range of 31W for all home computers exc. Atari

Cheques or P.O. to: P. Briggs, 85 Casslebury Ave., Bedford, Midds. TW14 9LE. Ring 01-890 8636 for fast friendly service. Guaranteed originals. State Micro's - SAE for special offers available on Spectrum & Dragon. Gunshot II £6.95 - Gunshot II £10.95.

PG44

AMSTRAD-FRED'S PROGS

Use Fred's
33 useful
utilities.
Plus five
progs. on
C60.
£7.00



SOLVE
YOUR
BASIC
PROBLEMS

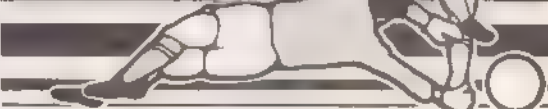
Despatch by return post guaranteed
FRED, 42 Blackrocks Av, Matlock DE4 3ND

* NOW AVAILABLE FOR THE AMSTRAD CPC 464!!

WIN THE POOLS?

SPECTADRAW 3 - THE LATEST VERSION OF THE
ORIGINAL AND BEST POOLS PREDICTION
PROGRAM FOR THE 48K SPECTRUM!!

AND NOW... AMSTRA-DRAW - THE NEW
POOLS PREDICTION PROGRAM FOR THE
AMAZING NEW AMSTRAD CPC 464!!



- Supplied with Database containing data on over 10,000 matches since 1980!
- You update the Database each week - but no tedious typing, as team and division names already in program!
- Errors easily corrected - the program even checks your entries!
- Comprehensive instruction manual and menu driven program easy to use, even for a newcomer to computing!
- Will forecast the least likely draws for those who prefer to bet on fixed odds!
- Built in perm generator - complete your coupon direct from the screen!
- Fully microdrive compatible! (Spectadraw only)
- Compatible with Currah Microspeech - the first pools program to read you its predictions! (Spectadraw only)

Spectadraw 3 for the 48K Spectrum £9.95 inclusive
Amstra-Draw for the Amstrad CPC 464 £9.95 inclusive
(Cheques/P.O.s payable to B. S. McALLEY)

We dispatch every Monday with the database made up to include all matches up to the date of dispatch

SPECTADRAW (Dept C), 1 Cowleaze, Chinnor, Oxford OX9 4TD.
(Tel: 0844-52426)

SPECTRUM

| GAME | RRP | OUR PRICE |
|-----------------------|-------|-----------|
| CYCLONE | 5.95 | 4.75 |
| DALEY THOMPSON | 6.90 | 4.99 |
| BEACHHEAD | 7.95 | 5.95 |
| WHITE LIGHTNING | 14.95 | 10.50 |
| SHERLOCK HOLMES | 14.95 | 9.99 |
| SABRE WOLF | 9.95 | 8.95 |
| KNIGHTS I DORE | 9.95 | 8.95 |
| UNCLE RYKORIE | 9.95 | 8.95 |
| LORDS OF MIDNIGHT | 9.95 | 5.95 |
| DOOMDARKS REVENGE | 9.95 | 5.95 |
| PSYTRON | 7.95 | 5.95 |
| FRANK N. STEIN | 5.95 | 4.50 |
| T.I.L. | 5.95 | 4.50 |
| FRASHMAN | 5.95 | 4.50 |
| NIGHT GUNNER | 6.95 | 4.95 |
| CLASSIC ADVENTURE | 5.95 | 5.25 |
| MONTY MOLE | 6.95 | 5.50 |
| FULL THROTTLE | 6.95 | 5.75 |
| MATCHPOINT | 7.95 | 6.75 |
| TWIN KINGDOM VALLEY | 7.95 | 6.50 |
| AVOLON | 7.95 | 5.25 |
| ENDURO | 7.95 | 5.50 |
| SCRABBLE | 15.95 | 4.75 |
| EDDIE KIDD JUMP | 7.95 | 4.95 |
| COMBAT LYNX | 7.95 | 5.25 |
| KOKOTONI WILF | 5.95 | 4.75 |
| DUES EX MACHINA | 15.00 | 10.75 |
| DARK STAR | 7.95 | 4.95 |
| JET SET WILLY | 6.95 | 4.95 |
| STAR STRIKE | 5.95 | 4.50 |
| TRAVEL WITH TRASHMAN | 5.95 | 4.50 |
| HAVOC | 7.95 | 5.95 |
| BACK PACKERS GUIDE TO | 7.50 | 4.25 |
| QUASIMODOS REV. | 6.90 | 4.90 |
| 11R NA NOG | 8.95 | 6.95 |
| AIRWOLF | 6.90 | 5.75 |
| MATCH DAY | 7.95 | 5.75 |
| PYJAMARAMA | 6.95 | 5.25 |
| BATTLE CARS | 7.95 | 5.99 |
| BLUE MAX | 7.95 | 5.99 |
| MACHINE LIGHTNING | 19.95 | 14.95 |
| POLE POSITION | 7.99 | 5.95 |
| MONTY IS INNOCENT | 6.95 | 5.50 |
| TECHNICIAN TED | 6.95 | 5.50 |

BYTE

| | | |
|---------------------|-------|-------|
| D DAY | 7.95 | 5.95 |
| TOWER OF DESPAIR | 7.95 | 5.95 |
| LOVE RUNNER | 9.95 | 7.25 |
| GREAT SPACE RACE | 14.95 | 11.25 |
| POTTY PIGEON | 6.95 | 5.25 |
| PITFALL II | 7.95 | 5.95 |
| YALKYRIE 17 | 9.95 | 5.95 |
| RAM TURBO INTERFACE | 7.95 | 6.50 |
| MATCH POINT | 9.95 | 7.95 |
| GIFT OF THE GODS | 6.95 | 4.95 |
| KUNG FU | 11.50 | 7.50 |
| TRIPODS | 7.95 | 5.95 |
| BOULDER DASH | 9.95 | 8.95 |
| SPIDERMAN | 7.95 | 5.95 |
| RUN FOR GOLD | 9.95 | 7.35 |
| RALLY DRIVER | 9.95 | 7.50 |
| GHOSTBUSTERS | 9.95 | 7.50 |

COMMODORE 64

| GAME | RRP | OUR PRICE |
|-------------------------|-------|-----------|
| GHOSTBUSTERS | 10.95 | 8.50 |
| SUICIDE EXPRESS | 7.95 | 6.50 |
| OTHER ACTIVISION | 9.95 | 7.25 |
| ZIM SALA BIM | 9.95 | 6.95 |
| STRIP POKER | 9.95 | 6.95 |
| PSYTRON 64 | 7.95 | 6.25 |
| TALES OF ARABIAN NIGHTS | 7.00 | 3.75 |
| BEACHHEAD | 9.95 | 7.50 |
| SOLO FLIGHT | 14.95 | 11.00 |
| DEATH STAR INTERCEPTOR | 9.95 | 7.50 |
| BRUCE LEE | 9.95 | 7.50 |
| NATO COMMANDER | 9.95 | 7.50 |
| PIREPIRE ACE | 9.95 | 7.50 |
| MY CHESS II | 11.95 | 8.25 |
| BATTLE FOR MIDWAY | 8.95 | 4.85 |
| HAVOC | 9.95 | 7.50 |
| ANCIPITAL | 7.50 | 5.50 |
| QUASIMODOS REVENGE | 7.90 | 5.80 |
| T.I.L. | 7.90 | 5.80 |
| KOKOTONI WILF | 6.95 | 5.25 |

| | | |
|------------------------|-------|-------|
| ZAXXON | 9.95 | 7.50 |
| SUMMER GAMES | 14.95 | 10.50 |
| QUO VADIS | 9.95 | 7.50 |
| SHERLOCK | 14.95 | 10.50 |
| PSI WARRIOR | 6.95 | 5.99 |
| STORM WARRIOR | 8.95 | 4.80 |
| RAID OVER MOSCOW | 9.95 | 7.50 |
| STAFF OF KARNATH | 9.95 | 7.25 |
| BLUE MAX | 9.95 | 7.50 |
| TAPPER | 9.95 | 7.50 |
| SELECT 1 | 12.49 | 8.50 |
| SPY VS SPY | 9.95 | 7.50 |
| BOULDER DASH | 8.95 | 7.25 |
| HOBBIT | 14.95 | 9.99 |
| DALEY THOMPSONS DECATH | 7.90 | 5.25 |
| KONG'S REVENGE | 7.90 | 6.90 |
| FIGHTER PILOT | 9.95 | 7.50 |
| TORNADO LOW LEVEL | 7.90 | 5.90 |
| BREAKFEVER | 7.00 | 4.95 |
| COMBAT LYNX | 8.95 | 6.95 |
| WHITE LIGHTNING | 10.95 | 15.95 |
| BLACK HAWK | 7.95 | 4.50 |
| RIVER RESCUE | 7.95 | 4.50 |
| SPIDERMAN | 9.95 | 6.99 |
| CAD CAM WARRIOR | 9.95 | 7.50 |
| F15 STRIKE EAGLE | 14.95 | 11.70 |
| MOTOCROSS | 7.95 | 5.80 |
| SUICIDE STRIKE | 7.95 | 5.80 |
| SPY HUNTER | 9.95 | 7.50 |
| IMPOSSIBLE MISSION | 8.95 | 8.75 |
| CASTLE OF TERROR | 9.95 | 7.50 |
| EMPIRE OF KHAN | 7.00 | 4.95 |
| SHOOT THE RAPIDS | 7.95 | 8.50 |

ALL PRICES INCLUDE P&P

QUICKSHOT II ONLY £8.99
PLEASE NOTE IF OUR ORDER
EXCEEDS £50 YOU GET
10% FURTHER DISCOUNT
SEND CHEQUES/P.O. TO
GOODBYE PCW 10
94 LEATHER LANE, LONDON EC1
(TEL: 01-404 4245)

ALL PRICES INCLUDE P&P

Open Forum

We are always actively seeking programs for publication - either for Open Forum, the machine pages or Star Game. When sending in a program for consideration, a clear program listing should be sent, together with, wherever possible, a saved copy on cassette. Documentation - usually not more than 1000 words - should start with a general description of the program, what it does, and then some detail of how the program itself is constructed. We pay very competitive rates, according to the length and nature of the program and the quality of the accompanying documentation.

Up Scroll on Amstrad

Up-scroll is not a true screen scroller but achieves the effect by drawing lines from bottom to top using 18 of the inks

available in *mode 0*. These ink colour values are incremented by two to give an effect of upward movement similar to that available on the BBC micro. *Side-scroll* is essentially the same as the previous but with the obvious exception that the lines are drawn vertically.

Windmill is based on a moire pattern with colour being added to give a fan effect similar to those above. Putting in different values for the increment gives strange results, a random value giving the effect of the windmill going clockwise and anti-clockwise.

```

UP - S C R O L L
10 REM ** By Simon Proctor **
20 MODE 0
30 C=1
40 FOR Y=400 TO 0 STEP -3
50 MOVE 0,Y
60 DRAW 640,Y,C
70 C=C+1:IF C>15 THEN C=1
80 NEXT Y
90 FOR A=1 TO 15
100 INK A,B
110 B=B+2:IF B>26 THEN B=0
120 NEXT A
130 GOTO 90

SIDE - S C R O L L
10 REM ** By Simon Proctor **
20 MODE 0
30 C=1
40 FOR X=0 TO 640 STEP 0
50 MOVE X,0
60 DRAW X,400,C
70 C=C+1:IF C>15 THEN C=1
80 NEXT X
90 FOR A=1 TO 15
100 INK A,B
110 B=B+2:IF B>26 THEN B=0
120 NEXT A
130 GOTO 100
    
```

```

110 B=B+2:IF B>26 THEN B=0
120 NEXT A
130 GOTO 90

WINDMILL
10 REM ** By Simon Proctor **
20 MODE 0
30 BORDER 0
40 C=1
50 FOR X=0 TO 640 STEP 0
60 MOVE X,0
70 DRAW 640-X,400,C
80 C=C+1:IF C>15 THEN C=1
90 NEXT X
100 FOR Y=400 TO 0 STEP -3.5
110 MOVE 0,Y
120 DRAW 640,400-Y,C
130 C=C+1:IF C>15 THEN C=1
140 NEXT Y
150 B=0
160 FOR A=1 TO 15
170 INK A,B
180 B=B+2:IF B>26 THEN B=0
190 NEXT A
200 GOTO 100
    
```

Arcade Avenue



On the map

The hot news this week is that the first people have written in having solved *Underworld* (I'm sure that you saw in the letters page a short while ago that we have also had the first to solve *Knight Lore* proving what hyper-advanced beings read PCW). The prize for *Underworld*, which I find so hard as to be absolutely infuriating, goes to Des Claypole of Peterborough, an old correspondent in this column, who finished with approximately 40,000 points and 28% (apparently

there is no high score table or record of the number of points scored once the game is over) at 7.30 pm back on the 10th of November when, as he rightly points out, most people hadn't even seen a copy.

On completion Des claims that you are asked to look out for a forthcoming program called *Pentagram* which nobody I know has heard of - could it be a pre-production name for *Knight Lore*? (How exactly did you get your copy so quickly, Des, have you got friends in high places?) As for the forthcoming Ultimate space game, it is actually called *Alien 8*, Des, so it shouldn't clash with the Argus Press game of the film *Alien*.

Here are some tips from the expert's mouth: "Although I finished it quickly, the game is certainly not easy, in fact it is much harder than *Sabre Wulf*, and it took me four to five hours a day for a week and it is vital to make a map. My map of the

400-500 locations took up 40 sheets of squared paper. Unlike *Sabre Wulf*, some of the squares on the grid remain unused and are empty.

"You need different weapons to get past various obstacles. There are four weapons, but you can only carry three at one time. The weapons are scattered about the game in a similar way to the amulet of *Sabre Wulf*; however, they are found in fewer places so once one is found the others can be more easily located."

Coming close second to Des is Nick Fisk of Bridgend who wrote on the 18th November after two weeks of play having scored only 32%. Unlike Des, Nick says the message at the end refers to *Knight Lore* (very mysterious) and advises anyone who hasn't seen the game to "go out and buy it" even though he admits it is "maddeningly frustrating".

Here are Nick's tips: "When you are on the ground walk, don't jump,

from one screen to another. To avoid the stalactites when you are on a rope, use the left and right keys to swing. Do not ignore what it says on the box. Make a map as if you get lost you will be very lucky to get back. You need the following weapons to kill these guardians: the stamping guardian needs the crossbow, the beetle needs the sword and finally the devil needs the fire."

Thanks very much, the pair of you, for those tips - please write again. Nick finishes off by passing on the way to get mega-scores on Daley's Decathlon but I'll be looking at that in a week or so - order your copy now.

Tony Kendle

The Arcade Corner is a new section for anyone who enjoys playing arcade games. If you have any comments from playing tips on difficult games or programs you'd particularly like to praise (or blame) then write to: Tony Kendle, Arcade Avenue, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.

48K SINCLAIR ZX SPECTRUM



BBC MODEL B 1-2 OS

48K SINCLAIR ZX SPECTRUM



48K SINCLAIR ZX SPECTRUM



COMMODORE 64



"KNIGHTLORE", "UNDERWULDE", "SABRE WULF", and "STAFF OF KARNATH" recommended retail price £9.95 inc VAT. Available from W.H.SMITH, BOOTS, J.MENZIES, WOOLWORTHS and all good software retail outlets. Also available from ULTIMATE PLAY THE GAME, The Green, Ashby-de-la-Zouch, Leicestershire LE6 5JU (P&P are included) Tel: 0530 411485

Tony Bridge's Adventure Corner



1984 (Contd)

This week I continue with the round-up of my favourite adventures of 1984.

Tower of Despair (Games Workshop)
Another Quill'd adventure, and here as a representative of several programs that arrived at The Corner throughout the year, catching the attention with their striking packaging.

The first of these was probably *Nosferatu*, from Odyssey, which sadly failed to make an impact despite the box full of scraps of paper, cinema tickets, torn pages from a diary and other clues, and the little coffin-like bed for the cassette. *The Donut of Dunsalt* (Anubis) was another package, well - designed and well-produced on a low budget. Both of these deserve to be picked up by a larger software house and marketed properly.

Tower of Despair comes with an illustrated booklet with clues in the pictures which complement the program. In the very first locations, for example, a couple of objects must be picked up, and their whereabouts is only apparent from the picture.

Tir Na Nog (Gargoyle)

I'm not a great fan of purely graphic adventures. Not because I think text-only is the only way to play, as the purists do, but because it is usually painfully obvious that the memory required to draw the pictures has been taken at the expense of location descriptions and puzzles.

To hark back to Infocom, their old cliché: "The player is free to let the imagination paint the scene".

Like all clichés of course, the basic truth behind the well-worn phrase is obvious. *Tir Na Nog*, however, is a good graphic adventure and one that I quite often load up, if only to see if I can figure what on earth is going on!

Lords of Midnight and Doomdark's Revenge (both Beyond)

Has to be mentioned - although the beautiful graphics have naturally put a constraint on the depth of the adventure strategy, the programs really draw the player into the atmosphere of the epic struggle between good and evil. Exactly what wargamers have been waiting years for.

Curse of the 7 Faces (Omicron/Artic)

Another of those adventures that turned up on the Grand Elf's desk with a covering letter which said: "What do you think, will I be able to sell this?" Definitely, I said, and I am glad to see that Artic have taken the game. Maybe now, more players will be able to experience the rich fantasy and well-designed text (with a Beeb-like script and colours of this program for the Spectrum).

The Ultimate Series (Sierra On-Line)

One of my favourite types of adventures is the 'experience-gaining' game, in which the player has to battle a way through a land populated with ever-stronger creatures, amassing gold and experience points along the way, the better to deal with monsters.

The Ultimate Series from the American company Sierra leaves a little to be desired as far as graphics are concerned, but otherwise is excellent. Players have to kit out their characters in the town's various shops before venturing forth into the countryside, where the battles are in painful real time. Documentation is extensive and well-written. Home grown programs are but a pale shadow, but include *The Ringseries* (for the Dragon) from Winterson, *The Valley* from ASP and *Barrow Quest* from CCS.

Games Without Frontiers (8th Day)

Six excellent, very cheap, Quill'd adventures that certainly don't suffer for their budget price. A few spelling mistakes

(spelling hasn't improved in 1984!) and no flash packaging, but the scenarios cover many facets of adventure-gaming and all six are fun to play. There's something for every grade of adventurer here.

The Quill and The Illustrator (both Gilsoft)

You may notice that many of my favourites are written with *The Quill*, Gilsoft's well-known adventure-creating utility. In my opinion, this must rate as one of the most important programs of 1984.

It has allowed creativity to run free and The Grand Elf's mailbox bulges with dozens of Quill'd adventures.

Some may only be of average interest, but all have been written with loving care. One or two are brilliant. I've only mentioned a few here, but believe me,



there are many more that bring a whistle of admiration.

Gilsoft has now licensed *The Quill* to Codewriter Inc. who have released versions for the Apple, Atari and C64 machines, so I expect 1985 to be a real Quill year.

Also, *The Illustrator* - Gilsoft's follow-up - has just been released. This, used in conjunction with *The Quill*, allows an author to incorporate pictures into a program.

One of the give aways that an adventure has been Quill'd are the system messages, such as "Bye now" which until now have been dictated by Gilsoft. Version C of *The Quill* which has also been released allows the author to edit these messages.

There have been many other adventures that I've enjoyed over the past year but there just isn't any more room here for me to cover any others.

If 1985 produces half as many terrific adventures as 1984, then I'll be a very happy person.

Adventure Helpline

Going bananas? If you are stuck in an Adventure with nowhere to turn do not despair - help is at hand

Fill in the coupon, explaining your prob-

lem, send it to us, and a fellow adventurer may be able to help.

Remember - the system only works if those adventurers who have solved the puzzles get in touch. Every week is Save An Adventurer Today (SAAT) week!

Adventure... on (Micro) ...

Problem...

Name...

Address...

This series of articles is designed for novice and experienced Adventurers alike. Each week Tony Bridge will be looking at different Adventures and advising you on some of the problems and pitfalls you can expect to encounter. So, if you have an Adventure you want reviewed, or if you are stuck in an Adventure you cannot progress any further write to: Tony Bridge, Adventure Corner, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.

SERVICES

REPAIRS—ZX81—Spectrum. Fast reliable repairs by experienced engineers, having serviced Sinclair computers since the introduction of the ZX80. Our price is inclusive of all parts, labour, postage and VAT irrespective of fault. No hidden charges. * While-you-wait service available. Spectrum £18.75, ZX81 £11.60, 16K Ram £9.95. Call or SEND WITH CHEQUE OR P.O. TO TV SERVICES OR CAMBRIDGE LTD French's Road, Cambridge, CB4 3NP Tel: 0223 311371

BBC SPECTRUM REPAIRS

- Spectrum repairs £18.50 inc parts insurance and p.p.
- BBC B repairs £18.50 + parts, insurance and p.p.

Send your computer with cheque or P.O. for £18.50 and description of fault to:

SUREDATA (PCW)
Computer Service
48 Wychemore Avenue, Edgware,
Middx

Tel: 01-851 0124

SPECTRUM repairs £12.50 all inclusive fast efficient 24 hr service M.P. Electronics, the Laurels, Wending, Dorset, Dorset, Tel: 0362 87337

SINCLAIR SERVICE CENTRE

We have the spares for all repairs to Spectrum ZX80, ZX81, ZX Spectrum, ZX11, ZX12, ZX13, ZX14, ZX15, ZX16, ZX17, ZX18, ZX19, ZX20, ZX21, ZX22, ZX23, ZX24, ZX25, ZX26, ZX27, ZX28, ZX29, ZX30, ZX31, ZX32, ZX33, ZX34, ZX35, ZX36, ZX37, ZX38, ZX39, ZX40, ZX41, ZX42, ZX43, ZX44, ZX45, ZX46, ZX47, ZX48, ZX49, ZX50, ZX51, ZX52, ZX53, ZX54, ZX55, ZX56, ZX57, ZX58, ZX59, ZX60, ZX61, ZX62, ZX63, ZX64, ZX65, ZX66, ZX67, ZX68, ZX69, ZX70, ZX71, ZX72, ZX73, ZX74, ZX75, ZX76, ZX77, ZX78, ZX79, ZX80, ZX81, ZX82, ZX83, ZX84, ZX85, ZX86, ZX87, ZX88, ZX89, ZX90, ZX91, ZX92, ZX93, ZX94, ZX95, ZX96, ZX97, ZX98, ZX99, ZX100.

QUANTUM
33 City Arcade, Coventry CV1 5HX
or phone Coventry (0203) 34633

MICRO-SERV

The home computer repair specialist in Scotland
BBC, SPECTRUM VIC 20 AND ALL PERIPHERALS. 3 MONTH WARRANTY ON ALL REPAIRS

UNIT 4, Denny Workspace,
Denny, Scotland FK8 8DW
Tel: Denny (0324) 823468

COMMODORE REPAIRS By commo-
dore approved engineers. Vic 20 Modu-
lators £8.50. Vic 20 from £14.50, CBM404
from £18, G24 from £7, printers, disc
etc. For more details write or tel: **B**
Bunce & Son, 38 Burlington Road,
Burnham Bucks SL7 7BQ Tel: 06286
61896

SINCLAIR COMPUTER REPAIRS

SPECTRUM £14.50
ZX81 £11.00
ZX PRINTER £12.50

inc. parts, p.p. and return insurance
Spectrum upgraded to 48K for £24.95
(turnaround - we like to make 90% of your
computer - please pack carefully and
send with cheque or P.O. to

I.T. (WESTERN) ELECTRONICS
97 Western, Trowbridge,
Wilt BA14 0BB

SPECTRUM REPAIRS

We expertly repair Spectrum for £15
inclusive of parts, labour and return
postage. Spectrum upgraded to 48K for
£28 including post.

A. A. ELECTRONICS,
89 Kimberley Road, Lowestoft, Suffolk.
Tel: (0502) 86288

Service and Repairs SPECTRUM, BBC, COMMODORE

MAIL ORDER OR CALL IN
Huge selection of software and full
range of accessories.

Enfield Communications,
135, High Street,
Ponders End, Enfield, Middx.
Tel: 01-805 7772

FAST SPECTRUM REPAIRS

MANCOMP LTD.



FIRST CO.
IN ALL U.K. TO
INTRODUCE WHILE-U-
WAIT SERVICE. NOW
FIRST TO OFFER AN
INTERNATIONAL
REPAIR SERVICE.

- MOST SPECTRUMS REPAIRED IN 45 MINS.
- PLEASE PHONE FOR APPOINTMENT FIRST.
- OR PHONE/SEND SPECTRUM FOR FREE ESTIMATES. ENC £1.80 (U.K.), £1.40 (IRE), £1.60 (EUROPE/SCANDINAVIA)
- NO HIDDEN HANDLING CHARGES
- 24 HR TURNAROUND.
- EVERY MICRO INSURED FOR RETURN JOURNEY.
- OPEN TILL 7 P.M. MON-SAT.

"I have come across a firm that will be more than willing to advise you as to how to remedy your problem. They are called MANCOMP. and as well as repairing faulty Spectrums, are also quite willing to discuss your problems with you, and offer reasonably cheap, and (more importantly) correct cures"

PHIL ROGERS 'PEEK & POKE'
"POPULAR COMPUTING WEEKLY"
JAN 1985 (VOL IV NO 1)

SPECTRUMS, DRAGONS AND COMMODORES

Expertly repaired and thoroughly overhauled by professional computer engineers using only top grade components. Manufacturers' recommended model cables are fitted and all Spectrums are fully guaranteed for six months. Spectrums £25.00 (incl. postage)

DRAGONS AND CBM Five Estimates
MP ELECTRONICS
The Laurels
Wending, Dorset, Dorset
Tel: 0362 87337

HEMEL COMPUTER CENTRE LTD.

For fast reliable repair service send your 1645K Spectrum computer to us
We will repair and return for £20 + return p.p.

Also BBC, Commodore, Atari and Dragon service

Hemel Computer Centre Ltd.
52 High Street,
Hemel Hempstead,
Herts HP1 3AF.
Tel: 0442 212436

EDUCATIONAL SOFTWARE

EDUCATIONAL SOFTWARE. Most home computers. For your free 24 page brochure, send to Jander Software Edgbaston House, Broad Street, Birmingham

PHYSICS O level for Amstrad Study program 'Refraction Ray diagrams' by experienced teacher. £4.95. H. James, 5 Gains Road, Portsmouth PO4 0PJ Tel: 0705 737090

GERMAN

Improve your German 5 Lessons on 1 cassette for Spectrum 48K. Each lesson has in many tests 4/5 instant corrections and scores £4.50 Ch.P.O. to

C.W. FAWCETT
42 Parley Avenue, Salford, Wilt BA1 2DS

Deutscher Express-Dienst

Auf Briten unserer deutschen Kunden bieten wir jetzt einen Reparatur-Expressdienst. Festpreis von £35.00 (einschl. Porto und Verpackung)

Sie senden Ihren SPECTRUM und £35.00 per Eurocheck (ohne Netzstromgerät oder Kabel).

Stecken Sie Ihren Brief in einen Umschlag ausser am Paket. Wir besorgen Ihren SPECTRUM am gleichen Tag aus, an dem wir ihn erhalten.

Sie sollten Ihren SPECTRUM innerhalb von 6 Tagen zurückerhalten.

Für dringende Reparaturen berechnen wir Ihnen einen Zuschlag von £8.00 zur Rücklieferung innerhalb 48 Stunden, überall in der Bundesrepublik.

Für Bildungseinrichtungen und Schulen gelten Sonderpreise.

Wir suchen Techniker für unsere geplante deutsche Niederlassung, die wir ausbilden und bitten um Zuschriften von Interessenten.

MANCOMP LTD. (DEPT PCW)
Printworks Lane,
Manchester M19 3JP
061-224 1685

UTILITIES

UNIVERSAL DATABASE SYSTEM for Amstrad CPC 464. Menu driven, easy to handle, sourcecode not protected. Recommended for beginners and advanced users. £12.50 for detailed information contact: Michael Holewa, Wilhelmstrasse 132, 1000 Berlin 12, West Germany

EXTENDED BASIC for your Spectrum + Interface 1. Includes LVAR, Run, Del, Stat, Find, and MEM. Now you can list all variables, delete blocks of program, examine microdrive files and more! SAE for details £4.95 for tape with full instructions for transfer to microdrive. R. Anderson, 57 Highbury Hill, London N5

KWIKLOAD

for the 48K Spectrum

This amazing utility package allows Spectrum cassette programs to load 3 times the normal speed.

The Hobbit loads in 120 seconds
Scrabble loads in 136 seconds

Full instructions supplied to convert most commercial software—£4.95 inc or send SAE for further details

Data View
32 Gladstone Road, Hockley
Essex SS5 4BT

DEALERS

MICROLINK

Look no further - only a phone call away for the most competitive link between the manufacturer and the customer in printers, computers, software, monitors etc.

And our new M.S.X. Quick Disk Drive - available on all micros

Tel: LISS (0734) 895296/895273



**Book
your
Classified
or
Semi-display
advert by
Credit
Card**

**Call
Diane
Davis
on
01-437 4343**



ANY CBM 64 s/w to swap Tel S. Moore 0539 32345.

BBC B. will pay £200 Tel Worthington 61004.

ORIGINAL BBC s/w wanted to buy, tapes or discs Tel (05827) 69152

WANTED SPECTRUM 16K or 48K preferably issue 2 or 3 will pay up to £80 for working 48K machine. Tel Redhill B5889 after 6pm.

DESPERATELY wanted: ZX printer. Will pay £20. Write to Mr Rajat, 95 Alexandra Gdns, Chiswick, London W4 2RZ.

SPECTRUM 48K. Good condition. Tel 01-709 5728 after 6pm.

WANTED Spectrum in any condition (preferably bought after September 82) Swap for 2000 AD collection. AV programs, annuities etc. Write to ■ 53 Howcroft Street, Bolton BL3 5LP (will deliver Manchester area)

SWAP Amstrad 464 computer for CBM 64. Tel Lea Valley 608606 or sell for £200

WANTED 48K Spectrum under £80 Tel Lea Valley 716 606

Wanted Spectrum originals s/w. Good prices paid. Tel 01-701 9485

SWAP Dragon 32K + tape recorder, joystick, software, light pen and guarantee for Atari 300 OR/XL preferably with tape recorder, or sell for £100 and All offers considered first 07373 55140 (over)

Wanted Deus ex Machine. Tel: Niel 01-341 3355

SWAP lightpen, 2 cartridges + a turbo loader for 4-slot motherboard or will swap lightpen, 5 cartridges + turbo loader for zero-electronics 40-80 column board. Tel Hounding 322131

WILL exchange Acorn BBC disc upgrade kit inc: 8271 (all 6 are brand new and unused) for Seiksha G880 printer (or similar) otherwise offer Tel Holmrook 381 (Cumbria) after 6pm

CGL (Sord) MS software and add-ons wanted (not journals). Write to K. Birtwhistle 183 Chiltern Drive, Hare Attraction, Chesham WA16 5PN. or Tel 061-928 0130

WANTED: Broken spectrums. Preferably with leads, PSU, manuals etc. Pay up to £20. Broken microdrives (interface) I also intend pay up to £18 each. Chris Tel 0482 781517 after 6pm

WANTED OL PEN PALS. Write in English, Dutch or French (I am Dutch). From Montreal 77 Av. des Chénies, H6B20 Etang La Ville, France

ATARI disk drive wanted. Tel Andrew on 0207 503777

ATARI disk drive wanted. Will pay up to £100 for 810 or £150 for 1050 with DOS 3. Tel 0207 503777

WANTED Saga 1 Emperor or Lo-Proke keyboard. Must be good cond swap for Stack light rifle Osborne books and 7 pieces of software or sell for £45 all excellent condition. Tel 0705 29 3076

WANTED. Newbrain peripherals software tapes, magazines, programmes, books. Please give full details and price required. Stevenson, Rookery Cottage, Vicarage Lane, Cadney, Brigg DN20 9S.

WANTED: Will pay Commodore 64 "Select 1" its full price or near. Write 54 Park House 314 Seven Sisters Road London N4 2LS.

WANTED Amstrad colour computer. Must be in good condition. Will pay up to £200 Tel 0502 712912 after 6pm.

WANTED AFG Protocol 4 joystick I/F to swap for stonchop programmable joystick I/F + £3 also wanted Boots/Smiths C15/C20s. Will pay 20p ea. Tel 0287 32581 (after 4pm on weekdays)

WANTED: CBM/Pet Computer. Also printer or disk drive, 4000 or 3000 series preferred, but would consider 2000 series. Please phone 0244 675717 evening or weekend.

TEXAS TI99/4A complete expansion system. Box, disc drive, control card RS232 32K. Any terep modules Tel Warwick 0926 49836

WANTED Spectrum business software especially cash book and normal led-

ger. Will buy or swap for other business or educational or games software. Tel Dave 051 424 5558.

WANTED Atari Microsoft Basic or Basic XL (QSS) cash paid for sale Zaxxon tape £8 and 8-Inator tape £5. Both for 16K Atari Tel 0277 219275

BROKEN computers wanted. Anything considered. Any condition Tel 0772 637686

For Sale

ORIC ATLAS 48K. 5 manuals, over 150 worth of s/w, spare leads, tape recorder + mags £130 Tel Dursley 47852

RATEC disc drive for BBC ■ used £115 Tel Sheffield 39869

EPSON MX80 PRINTER type 3 £150 one Tel 01-578 7704

MATTEL INTERVISION + 6 cartridges £90 one. Tel Chris King 01-500 4741

AMSTRAD games, half price all original + Amstrad Taspriest £12 Tel. 0272 559034 after 4.30pm

SHARPS M2700 64K cassette, printer, plotter, pens, paper, books, games, tutorials, databases, 5 months old. C290 or swap Atari 300XL/CRM64/Electron 48K Spectrum of similar value. Tel 0329 780 275

AMSTRAD CPC464 computer with col. on monitor plus software. Manic Minor Hunchback Code name Mut Roland Caves. worth £400 yours for £300 A Carter, 39 Ryan Street, Higher Openshaw Manchester M11 1LT

AMSTRAD DMP1 printer still boxed £140 one. Tel 02174 58046

SHARP M2-711 micro with tape deck + colour printer/plotter. Includes software and literature £270 one Tel 041 620 0032

1520 printer/plotter, hardly used manual, bargain £70 Tel 01-507 9572

MEMOTECH M12 512 boxed excellent condition, only £200 with three software tapes and joystick Tel Oxford 018651 7116C after 7pm

TRS 80 colour computers, 16K. Still boxed very good condition all leads and software game £90 one Tel 674 3996

PANASONIC combined television stereo, radio, tape recorder. Four built-in speakers worth £300 Swap for Commodore 64 + disk drive Tel 3248 353346

VIDEO GENIE 16K, built-in cassette deck, full size keyboard manuals books, sound kit software £100 one Tel 0342 685811 after 4.30pm

MICROVITEC CUB monitor model 1451 MS for BBC cost £310 in July. In use, as new condition. £240 Tel Basingstoke 51623

"COLOUR GENIE" computer. Perfect order. As new, including various cassettes of software games. All branded originals. All connecting leads included. Boxed. Bargain! £95. Might please Tel 0244 575717

TEXAS TI 99/4A computer. Hunchback Havoc + Colli cassettes, Soccer, Invaders + Tombstone City cartridges + two joysticks worth £200 - will sell for £80 one. Ideal Xmas present. Tel 0287 32561 (after 4pm on weekdays)

TEXAS TI99/4A with data recorder joystick, games books tapes and chess module, teach yourself Basic course £60 Games educational modules, £8 each Mr Clark 42 Embleid Close, Gravesend Kent Tel 0474 27197

MAPLIN 3001 320 band modem for sale no interface £25 one Tel 021 707 1843 (evenings only)

MAGS, MAGS, MAGS, all sorts of magazines. Some Spectrum and Dragon articles mssng, therefore only £1.50 for a bundle of 10 mags. Banner 20 Tamar Grove, Stafford

Ataris for Sale

ATARI VCS + 6 games. £50. Tel 01-619 3874

ATARI 600XL cassette recorder, joystick over 20 programs. 3 books, dust

cover, over 80 mags. Bound as new £120 Tel 0780 205158

ATARI 400, guaranteed, cassette recorder manuals lots of s/w, excellent condition £110 one. Tel Penketh 2526

ATARI 400 with basic cartridge, leads and manuals + Pacman cartridge. £60 one Tel Derek (0705) 828123

ATARI software originals, roms. Diado 19 Protector 2, Chicken-Tapes Leggit, Galactic Chase, Voyager 1, Disko Arcade machine, Dimension X, Encounter

Alitriko, Protector, Gorf, Frogger + many more - Romes £5 - Tapes from £3 - Disks from £5 Tel 01-550 0931

ATARI 800XL unwanted gift, lots of software reasonable offers Tel 05436 72065

ATARI 800 with 48K and the mighty Omnimon full instructions and joystick Tel Nigel 03708 5468

ATARI 400/800 software for sale, all titles are new and original mostly cartridges £5 each or 10 for £45 or £100 one Tel 021 749 4603

ATARI VCS plus four cartridges only £35 Tel 0865 731160 after 7pm

Spectrums for Sale

SPECTRUM S/W to sell at 1 originals only inc Sherlock, Grid Runner Bug & Boo, Printer, Spago Island and many more. Simon, 103 West Town

Bristolington Bristol BS4 6DX

48K SPECTRUM, 17 months old good condition, tapes + mags £100 Tel 01-554 5645 after 3pm

48K ZX SPECTRUM, C-90 games, Interface II, Quick Shot II joystick cartridge, tape recorder + 100 mags £170 Tel 0639 830 387

48K SPECTRUM + tape recorder, £150 worth of s/w inc Tel No-No, Lord of Midnight Tel Ingatstone 353722

SPECTRUM 48K boxed as new, leads + manuals. Fallen Box, Kempston joystick, interface + Quickshot, over £100 worth of s/w. Sell for £150 Tel Peter 01-858 5067

SPECTRUM S/W for sale over 50 titles, all originals, all half price, latest titles, Knight Lore £5, Aviation £4, In-Nag £5 etc. Tel 0703 735129 after 6pm

SPECTRUM 48K Interface 1, Interface 2, 2 microdrives, 110 Rom cartridges, RS232 interface, 10 microdrive cartridges, printer, 60 C12 cassettes mags, offers Tel Dava 0949 37127 anytime

SPECTRUM 48K + joystick + interface + RS232 interface will split £130 Tel 0782 658 854

48K SPECTRUM, Kempston joystick interface, tape recorder, books mags, s/w, under guarantee, worth £450 Sell for £170 Tel 01-212 9084 after 5pm

SINCLAIR SPECTRUM PLUS with interface only speech synthesiser joystick interface + games As new £190 Tel 01-773 0455

48K SPECTRUM lots of games, books, magazines and cassette recorder. Sell for £350 one. Write to S Royal, 33 Ealing Park Mans, South Ealing Road London W5 4QH

SPECTRUM Games, Cordix, Apocalypse, Vmco Chess, Play-Ed, Olympian, 1, Ching, Warlock of Fire Top Mountain £3 each Tel 3646 822 651

48K SPECTRUM Interface 1 + microdrive + two cart Interface 2, printer, 17 softwares (original), books magazines. Semi-working cassette recorder. Beep amp, £310 one Tel 01-202 8602 after 6pm. All day at weekends

SPECTRUM cassettes, printer, books. Over 70 games for your Amstrad CPC colour graphics and s/w etc. Will sell for the highest price Tel 0734 712255

SPECTRUM Matchday, Grand Prix Manager, Football manager, Abcsoft Forth, Sorker compiler, The Pen and The Dark. All originals. Original spectrum keyboard. Tel 01-858 3798

SPECTRUM ORIGINALS Hobbit £3.50, Feasibility Experiment, Tel Little Indians, Circus, Hulk £3, Urban Upstart,

Colditz, Quest Adventure, Knight's Quest, Forest World's End, Murder at Manor Inevitable Island, £2.50 Tel 0703 420016

SPECTRUM Software, s/w boxed, Hurg, Hobbit, Abcsoft, Forth, Shorlock Holmes, £3, Penastor, 40 Terra, Dykile Classic Adventure, Melbourne Draw £3 or all for £35 21 New Barns Road, Barrow-in-Furness, Cumbria

SPECTRUM: The Great Space Race by legend As. now, unwanted gift, cost £14.95. Sell for £3. Tel worcester 351817

SPECTRUM Software for sale, Avenger, Escape, Espionage Island Mr Wimpy, Racing Manager. Speed dmi £2.50 each (originals only). Tel: Allan on 0506 410016 after 6pm

SPECTRUM software Valthia £5, Sabre Wolf, £4, Swordlight, £1.50, Jolman £1.50, Speed Duel, £1.50, Hungry Horace £1 Miles. Tel 01-355 1777

SPECTRUM SOFTWARE. All originals. Hurg, £10, classic Adventure, £4, Lunar Jetman £3, PiMania, £5, Scuba Dive £3, Pyramid, £3, or the lot for £25. NIC/L Vanit, 181 High St, Sireol, Somerset

SPECTRUM utilities Dream Machine code for beginners, Dungeon Builder Picturesque Editor, Assembler, spectrum monitor, 17 50 nch Stonchop programme available joystick interface. £5 Tel 0703 420016

SPECTRUM SOFTWARE for sale at less than half price. All original titles Super games and utilities. To Chris Hall 61, Clevely Park Bolton BT8 4NB

BRAND NEW SPECTRUM SOFTWARE. Great Space Race, £9. Games Designer, Pula Position, Tawdrow Two £4 each. Chequered Flag, Chess, Kung Fu VUDJ and Make a Chip, £3 each Tel 470 0061

WHITE LIGHTNING SPECTRUM 48K original, £10. Nightlife II (Hewson) original Spectrum 48K, £4.50. Private sale, unwanted software (no copies taken) G. C Smith '94 South End Road Rannham, Essex RM13 7XJ

Commodores for Sale

VIC-20 SOFTWARE TAPES and Cartridges 8K RAM, super expander, 4-slot switchable motherboard, joystick, books, all in good condition, will sell complete or split. Your offers Tel 0382 4497

VIC-20 + C2N cassette + 16K RAM + 3K RAM, 17 games + intro base 142, joystick, perfect for learning basic. £60 the lot Tel 01-830 2626

COMMODORE 64 software for sale. Quo Vadis, High Noon, Outburst, Jungle, Space Pilot, Wimbledon '64 etc. Tel Rob 061-928 8354

CBM 64 + C2N + £200 software + music composer + joysticks + £50 books and mags etc £300 or exchange for 48K Spec + Int 1 + M/Drive(s) + Int 2 + joystick + keyboard + extras + £30 negotiable best system accepted Tel 01 863 5113 after 4pm

COMMODORE 64, games over £20, original games for sale on cassette disk and rom: also easycript + games, games designer, studio 64 on disk, batch purchases welcome ridiculous prices. Tel 01748 8378 weekend mornings

GONE 16-bit Commodore 8096 8050 dices Silicon office simply life simple. Write Whitley Chip JCL Business Rom. Calc Master Disc cleaning kit. Recorder, will split. Tel 0926 39381 evenings (Warwick)

VIC 20 16 Intro to Basic. Part 1. Mags, £10 of s/w. No cassette deck. £55 Tel sunny 01-889 9979 after 5pm

CBM 64 for sale with cassette player. Excellent condition. One year old. Plus fifteen games including Ghostbuster, Hunchback 2, Kong Strikes Back, £160 one. Tel 0203 219885 between 5-7.

VIC-20 (duplicated key) C2N, 8K RAM. But Plus, Forth, Motherboard, Speech synthesiser, Jupiter Lander, Pirates Cove, Adventure Land, Quickshot joystick, Centronics printer cable, consid-

erable software. Vic revealed quick sale £200 Tel Bas 42237
COLOUR VIC-20 deck cassette record or tapes including games and educational software excellent condition £70 Tel Ivor 653450

Dragon

BBC 1, 2, 3 months old still under guarantee Quickshot II joystick and over £200 worth of s/w. £350 Tel: 01-203 3923

BBC MICROMET Prestel prism acoustic modem s/w + leads £45 Tel: 01-864 3474

ACORN ELECTRON + tape recorder + £60 worth of s/w still under guarantee £180 ono. Tel 0742 50537

MITSUBISHI 40/80 track 400K disk drive for BBC with disc drive and over £1000 of software £230 Tel: 0582 769152

EPROM PROGRAMMER for BBC with two 18K Eproms and a 4-w programmer. roms, total value over £200 £270 Tel: 0582 774152

DRAGON USER GROUP for Romsey and Southampton welcomes new members with regular newsletters and weekly meetings Tel: 0794 23041 evenings for more details

DRAGON 32 computer. Boxed. Osam + Demos cartridge. CTRON recorder £160 of software magazines, books £150 ono. Waiter 80 column printer boxed + cable £180 ono Tel: 021-276 4884

DRAGON 32 + 200 of software + 2 quickshot II and a Tamlyn R/C Buggy swap or sell for an Atari 800/800X or CROM4 or Amstrad W/F split offers? Tel: Ipswich 0473 310662

DRAGON 32 joystick £50 worth of S/W + books £80 Tel: Dartford 77861 oves, Swanley 89234 Jay Mr Townshend

DRAGON 32 Artist software great Christmas present! loading saving attractive Great program for only £2 50

inc P&P. Contact David on 01-344 4765 after 4.15 pm any day.

BBC for Sale

WANTED BBC 0, C 5, 1-2 a/c U/F must be excellent condition Tel: John 06421 484785

WANTED BBC MODEL B or Commodore 64 with extras, will swap Alhambra classical guitar model 9c with music stand, foot stool and carrying case. Tel: 01-363 3363

BBC SOFTWARE for sale, half price, all original. Snowball Hobbit Fortress. 3-d yrs educational Wizard interface for joysticks Tel: Basingslope 51623

BBC - S/W + books worth £60 48K Spectrum with s/w and manuals £500 Tel: 01-455 3571

BBC SOFTWARE ELITE £9 Jet Pak 15 Zuluza 14 Missile Base, Space Fighter Galaxy Wars each WANTED Sabre Wul 30 Grand Prix Tel: 0829 51076 weekends only

BBC B 1.0205 with data recorder books and software mostly adventures Hobbit Five Levels 95 etc. £295 or swap for CBM 64 with disk drive Tel: Roy 0502 332076

BBC ACORN DFS Teac 40/80 track disk drive Haven 20 18K s/w disk sideways rom speech synth acoustic modem, wordwise, graphics rom + lots more £750 ono Tel: 01-505 0083

BBC II for sale - quickshot joystick, Acorn Prestel rom, Acorn modem - £130 s/w £500 ono will separate Tel: Don 0422 63716 after 6pm weekdays, anytime weekend

Acorn for Sale

BBC II complete with Acorn DFS k 1 B track double sided disk drive double density s/w, £650 ono Tel: 04427 7657

BBC B tape drive, user guide 30 hour

basic magazines 1 year old, mint condition £300 ono Tel: 01-398 6179

MICROVITEC CUB monitor for BDC model 1451 medium resolution cost £310 + jvy, little used, as new £250 ono Tel: Basingslope 51623

FOR BBC single DS-40T disc drive 200K1 in dual case with power supply including 10 discs, games and utilities £200 Tel: 0494 451103 evenings

BBC software for sale, all original, Hobbit Snowball Fortress education 3-6 yrs joystick interface, Vigen sideways Rom cartridge system all half-price or less Tel: Basingslope 51623

BBC B disc interface O/S 1.2 software, user case + we come cassette £340 Tel: 041-632 0347

ACORN ELECTRON, boxed as new inc electron interface + 1 Acorn tape deck 1.5's at s/w inc video. Sell £300 ono Tel: 0207 303250 1-6pm

BBC B 1.2 O/S Wulford DFS - Conon look drive Modem light pen joystick Wardrive and Prestel ROMS Acorn Speech Synthesiser. Lots at s/w £300 may split Tel: 01-428 1927 eves

BBC Mysterious Adventures for sale Escape from Pussar 7 (boxed) £3, the Imm-Matching (unboxed) £2 The WZ and Akryz (unboxed) £2 All originals Tel: Mark on 021 788 1605 after 6pm

BBC SOFTWARE a 1 original Less than half price Snowball Hobbit Fortress, Meteors Graphics 88 yrs Educational Wizard joystick interface Replica disk etc Tel: Basingslope 51623

BBC B, complete with data recorder parts of software wordwise etc Wanted perfect Quick sale required £316 or offer Tel: Bucks 0494-681916

ELECTRON, complete, electronic addresser dion plus £40 of original software £150 Tel: Notts 01771 671522

ACORN ELECTRON plus tape recorder inc £50 of original S/W Set quarters teed £180 ono Tel: Sheffield 107421 585377

MITSUBISHI 400K disc drive for BBC, supplied with leads, cables, manuals, disc doctor, Rom and S/W £290 Tel: 05827 69152

ELECTRON for sale powerful data recorder 2 joysticks, joystick interface, manual, leads, some S/W All brand new (unwanted gift) £250 Tel: Kipul 01-455 3185 6-9pm

For Sale

COMPLETE SET of The Home Compiler or Course by Orbis Only £15 including binders B Bonner 20 Tarnar Grove, Stafford ST17 9SC

PIMANIA £7.00 Reverse £2.50 Anti traffic control £4.50 All for Spectrum All originals Private sale unwanted tapes No copies taken G C Smith 88 South-ond Road, Hainham Essex RM13 7XJ

UNDERWORLDE by Ultimate for sale Original only £8.50 Also Pokos for Infinite lives in Underworlde Tel: 03943 2324 evenings and weekends

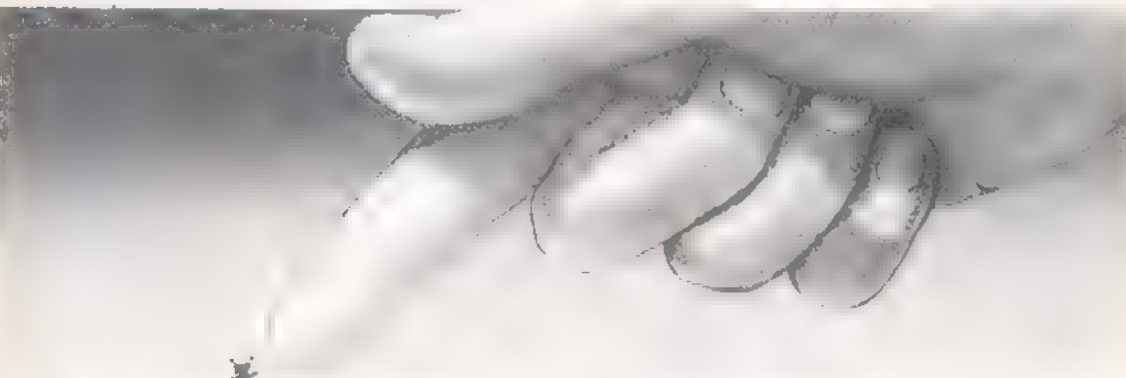
PORTABLE TV B.W. 6 months old £225 ono Must go Tel: 01-980 4811 ext 3736 or 01-771 3438 after 8pm

T199 4/A Expos cassette player, spare 6 joysticks, cartridge & cassette S/W Original Manuals listings, magazines etc Worth £500, sell for £350 ono, may split Tel: Morley 02934 73705 after 7pm

MATTEL INTELLIVISION + 6 cartridges, £90 ono Tel: Clive King 01-580 4741 ext 195 during office hours or Tel: Ashford, (Kent) 02278 after 7.30pm

THE ULTIMATE SPECTRUM add-on, a corporate sound and speech synthesizers ECP amplifier and joystick interface + complete with joystick £50 ono a swap for interface 1 with monodrive Tel: 01-574 4938

EPSON TX80 120 CPS printer that produces simple but good quality print, interfaces to most minis £120 ono Tel: Nick Rigby-Jones, Ashbourne 70445



Be the master of 49,152 pixels.

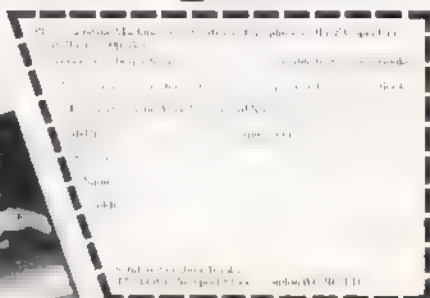
Get all your pixels on your Spectrum completely under your control. Dominate their existence. Mastermind their every move. And do it all in machine code, so they move fast to produce exactly the amazing displays you really want.

Here's a great new book from the Sunshine people, all about machine code sprites and graphics on the Spectrum.

Read it, understand it, and then start to move those pixels. And remember, with this new book you'll discover the secret of the shrinking window!

Look out in the book for a new machine code sprites, John Mervin, other leading experts and all the book is yours for only £4.95

machine code sprites and graphics for the ZX spectrum a complete guide to sprite coding



A Fair Deal For Our Advertisers

No guesses, no wishful
thinking – the circulation of
this magazine is audited to the
strict professional standards
administered by the Audit
Bureau of Circulations

ABC

The Hallmark of Audited Circulation

POPULAR Computing WEEKLY

★ CLASSIFIEDS ★

- ★ Popular Computing Weekly was voted magazine of the year by the C.T.A.
- ★ It has the highest Audit Bureau of Circulation figure of any weekly home computer magazine, currently 56,052 copies weekly.
- ★ It has a classified section that is now required reading for everyone with an interest in small micros, or who wants to buy or sell: SOFTWARE ★ UTILITIES ★ ACCESSORIES ★ SERVICES ★ HARDWARE ★ HIRING ★ CLUBS ★ RECRUITMENT ★
- ★ £6 per SCC semi-display, 25p per word lineage.
- ★ 6 day copy date.

CALL DIANE DAVIS ON 01-437 4343 FOR
AN IMMEDIATE QUOTE.

Popular Computing Weekly Sunshine,
12/13 Little Newport Street London WC2R 3LD



You've got your QL hardware. You've got your Psion software.

Quill Excel Archive & Abacus
on the Sinclair QL

introducing the QL software

Alison McCallum-Varey



Now get your Sunshine book.



Just released from Sunshine is the latest book from the highly acclaimed QL QLibrary series – and it's called *Quill, Excel, Archive & Abacus on the Sinclair QL*. All these packages, which are included with every QL sold, are recognised as powerful in their own right, but when working together with one another, they become highly effective problem-solving tools for business.

Alison McCallum-Varey's book introduces you to all the four packages, but, most importantly, shows you exactly how to run them as a complete system.

This book, essential for every QL Owner, will expand the day-to-day use of your QL, letting you run Quill and Archive in tandem for instance, and then outputting the results for graphic interpretation by the Easel package.

If you've Quill, Easel, Archive and Abacus on your Sinclair QL, then you need *Quill, Excel, Archive and Abacus on the Sinclair QL*.

For more information, contact Alison McCallum-Varey, 12/13 Little Newport Street, London WC2R 3LD.

For more information, contact Alison McCallum-Varey, 12/13 Little Newport Street, London WC2R 3LD.

For more information, contact Alison McCallum-Varey, 12/13 Little Newport Street, London WC2R 3LD.

For more information, contact Alison McCallum-Varey, 12/13 Little Newport Street, London WC2R 3LD.

For more information, contact Alison McCallum-Varey, 12/13 Little Newport Street, London WC2R 3LD.

For more information, contact Alison McCallum-Varey, 12/13 Little Newport Street, London WC2R 3LD.

For more information, contact Alison McCallum-Varey, 12/13 Little Newport Street, London WC2R 3LD.

For more information, contact Alison McCallum-Varey, 12/13 Little Newport Street, London WC2R 3LD.

For more information, contact Alison McCallum-Varey, 12/13 Little Newport Street, London WC2R 3LD.

For more information, contact Alison McCallum-Varey, 12/13 Little Newport Street, London WC2R 3LD.

For more information, contact Alison McCallum-Varey, 12/13 Little Newport Street, London WC2R 3LD.

For more information, contact Alison McCallum-Varey, 12/13 Little Newport Street, London WC2R 3LD.

For more information, contact Alison McCallum-Varey, 12/13 Little Newport Street, London WC2R 3LD.

For more information, contact Alison McCallum-Varey, 12/13 Little Newport Street, London WC2R 3LD.

- Vic 20**
- (-) 3D Maze (Mastertronic)
 - (-) Vegas (Aciphot) (Mastertronic)
 - (-) Star Hunt (Mastertronic)
 - (-) Undermine (Mastertronic)
 - (-) Space Scramble (Mastertronic)
 - (-) Snake Bit (Firebird)
 - (-) Miner Gold (Vicomat)
 - (-) Perils of Wally (Software Projects)
 - (-) Sub Commander (Ticom Ltd)
 - (-) Duck Shoot (Mastertronic)
- (Figures supplied by Boots/Websters)

- Commodore 64**
- (-) Raid over Moscow (US Gold)
 - (-) Daley Thomson Decathlon (Ocean)
 - (-) Warrior Attack (CDS)
 - (-) Fighter Pilot (Digital Integration)
 - (-) Jet Set Willie (Software Projects)
 - (-) Combat Lynx (Mastertronic)
 - (-) Suicide Express (Gremelin)
 - (-) Star Hunt (Mastertronic)
 - (-) Beach Hunt (US Gold)
 - (-) Star Ace (Mastertronic)
- (Figures supplied by Boots/Websters)

- Spectrum**
- (1) Daley Thompson's Decathlon (Ocean)
 - (2) Beachhead (CDS)
 - (-) Match Day (Ocean)
 - (-) Combat Lynx (Ocean)
 - (-) Jaspur (Micromega)
 - (-) Pyjamarama (Micromega)
 - (-) Battle (Micromega)
 - (-) Polo Passion (Atari)
 - (-) Boulderdash (K Tel)
 - (-) Run Baby Run (Firebird)
- (Figures supplied by Boots/Websters)

- BBC**
- (-) Return to Eden (Level 9)
 - (-) Sabre Wulf (Ultimate)
 - (-) Trek (Acornsoft)
 - (-) Polo Passion (Atari)
 - (-) Twin Kingdom Valley (Bug Byte)
 - (-) Basic Extension (Micromega)
 - (-) Bridge Master (Bridge Master)
 - (-) Number Skills 0-20 (Longman)
 - (-) Number Skills 0-99 (Longman)
 - (-) Number Fun (Grimm)
- (Figures supplied by Boots/Websters)

- Atari**
- (-) Solo Flight (Centrosol)
 - (-) O'Rly's Mine (Centrosol)
 - (-) Tank Commander (Thorn EMI)
 - (-) Computer War (Atari)
 - (-) Carnival Massacre (Atari)
 - (-) Attack of the Mutant Camels (Atari)
 - (-) Zaxxon (Centrosol)
 - (-) Gridrunner (Atari)
 - (-) Submarine Commander (Thorn EMI)
 - (-) Cavemen of Kaba (Centrosol)
- (Figures compiled by Boots/Websters)

Dragon
No Dragon chart was compiled over the past two weeks, but it will return next week.

Wanted

HELP! Looking for Acorn Atom software? Listings in tapes. Make offer: Wolfgang Gersinger Altweg 11 D-5305 Alfter West Germany.

WANTED Currah micro speech must be as new in superb condition. If possible in Cambridge area. Lots of brand new and secondhand original Spectrum programs. Tel: 0763 61392.

WANTED Acorn Electron - Tape Recorder, SW Tel: Daniel on Northwood 24995 or Jim at 01-992 2130.

VETNEX games console - 10 games. Swap for Spectrum or similar computer. Tel: 01-732 0832.

WANTED I Premier Delta Disc owner to exchange discs, hints, tips for Dragon Computer. Tel: Rob - Staines 58707 after 6pm.

Event Dates Venue Admission Organisers

| | | | | |
|--|--|------------------------------------|---------------------------------|-------------------------------------|
| Which Computer? Show (over 15s only) | Jan 15-17 (1985) 10.00am-5.00pm Jan 18 10.00am-4.00pm | NEC Birmingham | Free in advance from organisers | Clapp and Polak 01-691 5051 |
| Hi-Technology and Computers in Education Exhibition | Trade: Jan 24 10.00am-1.00pm Educational: Jan 24-1.00pm-8.00pm Jan 25-1.00pm-8.00pm Public: Jan 26 11.00am-6.00pm | Barbican London EC2 | Free in advance from organisers | Computer Marketplace 01-930 1612 |
| Agricultural and Farming Computer Show | Feb 5-7 10.00am-6.00pm | Essexington Town Hall London W8 | Free in advance from organisers | Paradox 01-241 2394 |
| The LBT 85 International Trade Show | Feb 17-18 10.00am-6.00pm Feb 19 10.00am-6.00pm | Olympia 2 London W6 | Free in advance from organisers | Thorn/Whitland 0833 777000 |

Readers' Chart No 6

- (1) Knight Lore (Spectrum)
 - (2) Daley Thomson's Decathlon (Spectrum/C64)
 - (3) Ghostbusters (Spectrum/C64)
 - (4) Underwulde (Spectrum/C64)
 - (5) Elite (BBC/Electron)
 - (6) Booty (Spectrum/C64)
 - (7) Beachhead (C64)
 - (-) Pyjamarama (Spectrum/C64/Amstrad)
 - (-) Manic Miner (Spectrum/C64/Amstrad/Dragon/MSX)
 - (-) Staff of Karnath (C64)
- Ultimate Ocean Activision Ultimate Acornsoft Firebird US Gold Mikro-Gen Software Projects Ultimate**

Week 6: No winner.

Now voting on week 8

Each week Popular is compiling its own special software top ten chart - compiled by YOU.

All you have to do to vote is to fill in the form below with the names of your current three favourite software titles (or copy the form on to another sheet if you don't want to damage your magazine) and send it off as soon as possible to: Top 10, Popular Computing Weekly, 12-13 Little Newport Street, London WC2H 7PP.

Voting for Week 8 closes at 2pm on Wednesday January 16 1985. Entries received after that time will not be eligible for inclusion in that week's voting. The judges' decision is final. Only one entry per individual per week will be allowed.

| | |
|---------------|-------------------------|
| Name | My top 3: Voting Week 8 |
| Address | 1..... |
| | 2..... |
| | 3..... |

New Releases

BLAST-A-MINUTE

This new release is addressed to those five people who still have and use a ZX81, so it's definitely select minority time. Those people who buy games for the ZX81 at all must surely already be collecting the Software Farm games with a religious fervour.

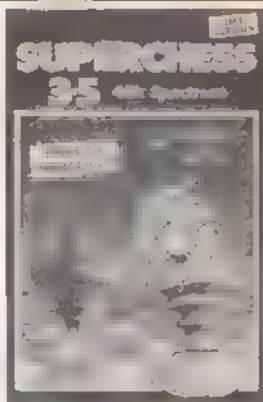
Software Farm's high resolution routines strike again in *Z-Xtricator* which is apologetically described as 'more of a standard *Space Invaders* type of game' which 'does not give much scope for showing off the high resolution' - such honesty will make you bankrupt.

The game is basically a blast-a-minute, wave and waves of aliens affair. You have to pilot a ship down to a plane surface, pick up some survivors and return to the top of the screen defending yourself for the combined assaults of various hi-res aliens. There isn't much else to it, but then there never is to such games, so what do you expect. And anyway, let's not discourage the only software house currently (to my knowledge) producing ZX81 software that can even loosely be described as of commercial quality.

The company also runs a ZX81 software club - more details from the address below.



Program *Z-Xtricator*
Price £5.95
Micro ZX81 16K
Supplier Software Farm
155 Whiteladies
Road
Clifton
Bristol BS8 2RG



BEEFED UP

The question of which version of chess for the Spectrum is the most powerful I shall leave to those who don't always get thrashed on novice level.

However, one of the neatest and fullest featured versions I've seen is *Superchess 3.5* by Deep Thought and being distributed by CP Software.

The main feature of the program, which is a beefed-up version of an earlier program, is a save to microdrive facility - not only games in progress but the entire program.

A facility which is surely trivial to implement but is a big bonus for those who have microdrives but would not otherwise know how to break into a commercial program.

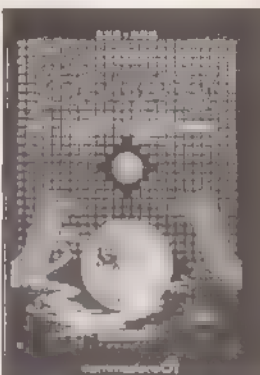
Other features of the program include a level option which is expressed in terms of how many seconds, on average, you want the computer to think about each move - always a useful way of doing it - and analyse position to set up chess problems.

You can get the computer to work out a mate in between one and four moves; change the colours and it will tell you the moves it is thinking of and how many levels of play it has analysed so far.

Program *Superchess 3.5*
Price £9.95
Micro Spectrum
Supplier CP Software
2 Clebe Road
Uxbridge
Middlesex
UB8 2RD

Pick of the week

PRETTY COSMIC



Since very many people may have bought or been bought records at Christmas, the timing of *Psychodelia* probably couldn't have been better. Jeff Minter's program brings you the experience of an early 70's rock concert (Hawkwind for example) in your very own home and under your control. Actually *Psychodelia* gives you more than that, the possibilities are pretty cosmic actually, man.

Psychodelia has been termed a Light Synthesiser and that seems as good a description as any - you can manipulate multi-coloured patterns of ever changing light using a joystick. The program is much easier to use than explained. Roughly speaking, you start with a number of presets which select basic shapes by moving a central cursor around and by pressing fire you can generate this effect anywhere on the screen. Because the effect has a temporal element (like a decay in music) the patterns overlay one another, intermingle and form complex, somewhat symmetrical patterns which change from moment to moment.

But its more complicated than that - there is a sequencer effect which lets you create, store and replay endless-

ly up to half an hour's worth of pattern and then create 'live' patterns over the top. There are all sorts of other controls for 'pulsing', 'burst generators' etc, etc - but as Jeff Minter says in his program notes the best thing is just to try it all out and see what happens.

Amazingly inventive and with the lights out and music, well... awesome probably.

Program *Psychodelia*
Price £7.50
Micro Commodore 84
Supplier Llamasoft
49 Mount Pleasant
Tadley
Basingstoke
Hants

AN IN-JOKE

Remember *The Quest for the Holy Joystick*? The game was a Quilled text adventure which was notable for, amongst other things, featuring the computer buffs' favourite places, eg, ZX Microfairs at Alexandra Palace and the Automata Stand - even Tony Bridge.

Now we have the sequel which features parodies of many well known adventures, including *Sherlock*, and the Ultimate Sabre Man character - and, well, pretty much anything you can think of.

The game has been created with the addition of the new

Illustrator - the Quill utility which provides graphics for your Quill text adventure - this is used to make the parodies that bit more complete, eg, the Baker Street entrance of *Sherlock* is faithfully recreated.

Although it does work as an adventure - there are objects, clues and conundrums that will eventually lead you to the legendary joystick itself - the real point is, I suspect, a series of in jokes.

Apparently, even I am in it (now I know how the wax dummies in Madame Tussaud's feel), as are the Popular offices which are the biggest and most challenging maze you'll ever come across.

New Releases

Program *Return of the Joystick*
Price £4.95
Micro Spectrum
Supplier Delta 4 Software
 The Shieling
 New Road
 Swarnmore
 Hants SO3 9PE

A CLASSIC

The really surprising thing about *Lords of Midnight* on the Commodore 64 is how exactly similar it is to the Spectrum version. Not only are the rules, characters and plot the same, but even things like the exact graphic shapes, text font and so on are indistinguishable. The only difference is the addition of a sun which travels the sky as time goes on, setting red as the day ends.

I'm sure most Commodore owners will already be familiar with the game and indeed will have been awaiting this release eagerly. Nevertheless I'll summarise the idea.

The game mixes adventures and wargames in a battle between assortments of goodies, baddies and maybes who can perhaps be recruited to your cause. You can win the game either by a massive wargames style control of forces or by an adventure style quest using a few of the characters to destroy the wicked Ice Crown.

The game features detailed and evocative still graphics which - unlike usual graphic adventures, are logical in terms of direction, ie, if you see a tower in the far north and continue to go north eventually the tower will get bigger and bigger until you arrive at it. The game can require a number of different

skills from adventure style investigation and perseverance to strategy control and organisation. The computer controls the baddie forces and plays well. An excellent adaptation of a classic program.

Program *Lords of Midnight*
Price £9.95
Micro Commodore
Supplier Beyond Software
 Lector Court
 153 Farringdon
 Road
 London EC1R 3AD

NO BAGATELLE

Whatever else is true *Island of Xaan* must be the only adventure to come with a freebie that is worth having. If you buy this text adventure within a certain period of time you get a neat little Adventurers' notebook with different coloured paper in which to record your failures, wrong guesses, wrong directions and the like. As mere bagatelles go, it's less mere than most.

The adventure is simple in format - text only, and in the two-word *Do Get Look* style, although different sections of text are printed in different



colours. The idea is to escape from imprisonment on the isle of the title and finally, wearing a disguise, get off the island completely.

What it lacks in graphics it makes up for in lengthy scene setting descriptions. I doubt the BBC has much spare memory when running this one. The opening has you dumped in a cell with no windows and a locked door. Classic 'how on earth do I get out if I can't find anything' stuff. However, an alcove reveals a chain, and with a lot of effort the chain comes loose. My bet is that its function is violent but you wouldn't want me to spoil it for you, would you? It'll need more time than I've been able to give it but I suspect this could prove to be one of the best text adventures on the BBC.

Program *Island of Xaan*
Price £7.95
Micro BBC
Supplier Robico Software
 3 Fairland Close
 Llantrisant
 CF7 8QH

TORTUOUS MAZE

Zaga Mission is a sort of *Zaxxon* with a helicopter instead of a plane and with the accent firmly on negotiating the tortuous twisting 3D maze rather than fighting it out with the baddies.

Flying helicopters requires a quite different set of skills from the usual up, down, forward, backward, left, right - the latter two movements have to be carefully judged and tend to involve drift. Going forwards seems even more fraught with difficulties.

The mazes on *Zaga Mission* are much more complex than anything in *Zaxxon*; often it's a matter of inching forward and clearing giant brick walls



by tiny amounts. Not that you get all day to master each section of maze - a time limit is created by the need to refuel frequently and the chances to do this are few and far between.

Graphically it's good - the helicopter is particularly well done - although the brick walls are coloured such that the correct perspective is often difficult to assess, possibly intentionally. I sweated over it for quite a while, anyway.

Program *Zaga Mission*
Price £7.95
Micro Commodore 64
Supplier Antrog Software
 28 West Hill
 Dartford
 Kent

BLOOD CURDLING

Castle of Terror is a new graphics adventure from Melbourne House. With the recent release of *Sherlock* it has tended, despite many ads, to be a bit ignored but it is actually one of Melbourne's best releases ever.

The graphics are among the most detailed ever seen on the Commodore, and despite this they are drawn

This Week

| Program | Type | Micro | Price | Supplier | Happy Hippy | Ad | Spectrum | £3.00 | B Goldie |
|--------------------|------|--------------|--------|-----------------|----------------------|-----|----------|-------|--------------|
| Black Phoenix | Ad | Amstrad | £4.95 | Gavin Barker | Heroes of Karn | Ad | Spectrum | £5.50 | Interceptor |
| Portfolio | Ut | Atmos | £22.50 | Financial - Gen | 10 Great Games | Arc | Spectrum | £7.50 | Infinite |
| Pixel Potter | Ut | BBC | £14.95 | Toad | Hypertron | Arc | Spectrum | £1.89 | Kevin Madden |
| School Database | Ut | BBC | £39.95 | Toad | Heathrow Internal | S | Spectrum | £7.95 | Hewson |
| Castle of Terror | Ad | Commodore | £9.95 | Melbourne Hse | Starboard | S | Spectrum | £8.95 | Infinite |
| Empire of Karn | Ad | Commodore 64 | £7.00 | Interceptor | Character sets | Ut | Spectrum | £3.99 | Infinite |
| Indiana - Lost Kdm | Arc | Commodore 64 | £9.95 | US Gold | Finance Manager | Ut | Spectrum | £9.95 | Elephant |
| Monsters | Arc | Commodore | £6.95 | Discus | M.S.W.M. | Ut | Spectrum | £2.99 | Infinite |
| Afghan Attack | Ad | Spectrum | £9.95 | Southern | M/code sound library | Ut | Spectrum | £3.99 | Infinite |

quickly enough to avoid irritation. More than that, in places they are animated. Not, I should add, in the *Vahalla* sense of characters wandering about, but small sections of each picture move to give a heightened sense of realism to each scene.

Apart from the graphics, the game also uses the Commodore's sound facilities to something like the degree I've always felt they ought to be used in adventures. Since this adventure is called *Castle of Terror* you can guess that there is much creaking of doors and other mysterious clankings. The game is set in 1800 in a little village near an imposing castle where lives a Count with a strange taste in thirst quenchers. Like *Sherlock*, the program comprehends complex sentences where more than one instruction is strung together, eg, *Get the Axe and the Knife and put them in the sack*. Also, the irritation that comes from knowing exactly what you want to happen but the computer stubbornly refusing to understand any of your synonyms is largely soothed by an option to display the action verbs the program understands at any point in the game.



Basically, if you like adventures and have a Commodore 64 you'll have no reason not to buy this one.

Program *Castle of Terror*
Price £9.95
Micro Commodore 64
Supplier Melbourne House
Castle yard House
Castle Yard
Richmond
TW10 6TF

TACTICAL WAR

Afghan Attack is a sophisticated text adventure game for the Spectrum from Southern Software. It posits your intervention as commander of a group of British paratroopers in the Soviet/Afghan war. You must disrupt Soviet troop movements, harass their supplies and generally make things difficult for the ungodly Commies.

The adventure is divided into two large sections and consists of more than just the usual adventure features. There are some tactical elements as you try to deploy your men correctly and you will frequently need to communicate with other characters.

An immediate criticism must be of the basic level of English in the adventure. At £9.95 it has to be a professional product and the changes of the tense for no reason, difficult to read screen layout and naff phraseology, eg, "his face cracked into a smile", which is about the same as, bashing into a grin. But enough of this irrelevant levelling of criticism - what about the game?

Firstly it may be *Quilled* which means nothing in particular but gives you an idea of how the game looks on screen. It's also tough, or at least begins with a seemingly



difficult conundrum. One bug appeared when I tried one obvious option of *Load Weapons* as first command. The screen went red and blue and the thing thought it had to load a program.

The solution to the first problem really is easy when you think about it and after that there is much to explore. I think the game probably will prove to be addictive and at least somewhat original.

Program *Afghan Attack*
Price £9.95
Micro Spectrum
Supplier Southern Software
6 The Hillway
Fareham
Hants PO16 8BL

SPOOKS AROUND

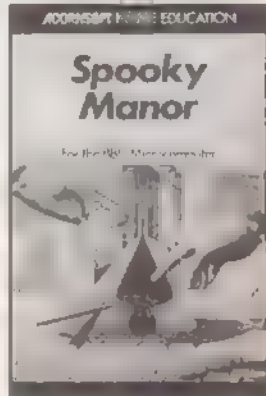
Spooky Manor is a new Acornsoft program that looks vaguely like an adventure but is really a kind of educational program for up to four kids.

The screen is divided up into four sections with each player's 'adventure' occurring in each one, therefore in some locations one player might meet another. The usual commands are understood - *Take, Open, Unlock*, etc. If one player finds something

and drops it, another player may come across it and pick it up - in some locations more than one player is necessary to complete an action.

The idea is for each player to collect as much treasure as possible, and no player may escape until the ghosts that haunt the manor have been banished - by the removal of one particular treasure.

The idea is excellent although obviously the way each player has to take it in turn to enter instructions is somewhat clumsy. BBC adventurers with at least one



friend should give it a look.

Program *Spooky Manor*
Price £9.95
Micro BBC
Supplier Acornsoft
Betjeman House
104 Hills Road
Cambridge

Compiled by Graham Taylor

New Releases is designed to let people know what software is coming on the market. If you have a new game or utility which you are about to release send a copy and accompanying details to: New Releases, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.

This Week

B Goldie, 211 Mui Petersburn, Airdrie, Scotland, ML68 DP **Discus**, Freeport, Windmill Hill, Brixham TQ5 9BR **Elephant**, Ashlea, Jepps Lane, Barton Preston, Lancs PR3 5AQ, 0772 864972 **Financial + Gen**, FGC Meadowcroft, Euxton, Chorley, Lancs PR7 6BU, 02572 70088. **Gavin Barker**, 12 Fleming Field, Shotton Colliery, County Durham DH6 2JF, 0783 261405. **Hewson**, 7 Grahame Close, Blewbury, Oxon OX11 9QE, 0235 832939. **Interceptor**, Interceptor Micro's, London House, The Green, Tadley Hampshire, 07356 71145. **Kevin Maddon**, 8 Pine Dale, Rainford, Merseyside WA11 8DP. **Melbourne House**, 39 Milton Trading

Estate, Abingdon, Oxon OX14 4TD, 0235 835001. **Southern**, 6 The Hillway, Fareham, Hants PO16 8BL **Toad**, 8 Westbourne Grove, Sala, Cheshire M33 1RP, 061 959 4740. **US Gold**, US Gold, Unit 10, The Parkway Ind Centre, Heneage Street, Birmingham B7 4LY, 021 359 3020.

This Week is a new section that covers all the new software coming on to the home micro market each week. All suppliers should send details of their new programs to: This Week, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD



State of the nation

With the Winter CES show held last weekend, it seems a good time to look at the state of the US software industry.

The dreams that were imagined are still alive here... just. But they are not at all well, as they struggle against disinterest, extortionate costs and the inefficiency born from a lost age of explosive enthusiasm and growth.

Software prices are mainly between \$30 and \$40, if it's any cheaper it isn't worth buying, so they say! One software house wondered how we could make a living in the UK on prices between five and ten pounds. I asked him why he didn't wonder how we could sell as many units of a title as he could, in a market one quarter the size of the States.

"There are now only a dozen players in the market," I was told on my first jet-lagged day. "By the summer it will be down to eight - maybe less."

At Activision, everyone smiled. Joke notes

were pinned up everywhere. It had been a good Christmas.

"We're the biggest in the UK," said the Activision man. I smiled and raised an eyebrow. He grinned. "Well... *Ghostbusters* is Number One."

Elsewhere the story was different, as I met demoralised and sad executives. In the valley, if your boss says goodbye in the morning, you're fired. I got the feeling that quite a number of \$75K heads will roll in January.

In Seattle, Microsoft sits in a cerebral lotus position. A couple of hundred million dollars will drop through their letter box over the next 12 months, and they have positioned themselves in the eye of a hurricane that is sweeping many of their competitors away. If IBM wasn't so big, it might now be holding Microsoft's hand even tighter. Who is to say that in ten years' time, with hardware spiralling down in cost and software spiralling up, that hardware will not be given away when you buy software?

Both allies, IBM and Microsoft, are for the moment very happy with the way things are looking.

What of Microsoft's Oriental friends and their MSX. If you think MSX spells Home Computer you should think again. MSX is a computer co-ordinated world conceived in Seattle and nurtured in Japan. "Picture this," said the Microsoft executive as he bought me a Mexican lunch. "An MSX washing machine, MSX microwave, MSX hi-fi, MSX video, MSX musical instruments, televisions, compact discs, dish washers. Imagine anything electrical, computer controllable and compatible to a standard. That's MSX."

Several hours later on the plane from Seattle to San Francisco, the enormity of the concept struck and pressed a button called 'jaw drop'. An MSX world? US software and Japanese hardware in a future world of Sci Fi comfort and white goods?

At Las Vegas last week the Winter Consumer Electronics Show drew the US computer world together for a moment. Most Stateside companies cherish fond memories of past successes there and in Chicago. Their now shrunken show budgets indicate how things have changed. They were relying on this year's show in the city of vice to bring a new glimmer of hope.

The question now is whether the market has reached a turning point or just a dead end.

My feeling is that the turning point for a few will be the dead end for many.

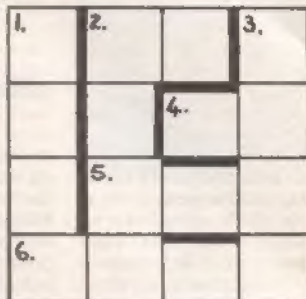
Clement Chambers

Puzzle No 140

In this crossnumber puzzle, the values of the expressions given in the clues must be fitted into the grid - as in a normal crossword only using digits instead of letters.

Can you find the values of A, B, C, and D?

| Clues - Across | Clues - Down |
|----------------|--------------|
| 2 C | 1 A * B |
| 4 C - A | 2 B * C |
| 5 C * D | 3 A' |
| 6 C' | |



Solution to Puzzle No 138

The amount of money that Eric started with must have been exactly divisible by five, and also must have had the number of pounds greater than the number of pence.

The program calculates the variables which must - at each stage - end with a whole number of pence, and also end finally with the original values for pounds and pence in reverse order. When Run the program shows that Eric started out with £48.15.

```

15 FOR PENCE=0 TO 99 STEP 5
20 FOR POUNDS=PENCE+1 TO 99
30 LET S=POUNDS*100+PENCE
40 LET S=S-(S/5)
50 LET S=S-60
60 LET S=S-(S/4)
70 LET S=S-300
80 LET S=S-(S/3)
90 LET S=S-70
100 LET S=PENCE*100+POUNDS
110 IF S=S THEN PRINT "ORIGINAL SUM=";POUNDS;";
PENCE
120 NEXT POUNDS
130 NEXT PENCE

```

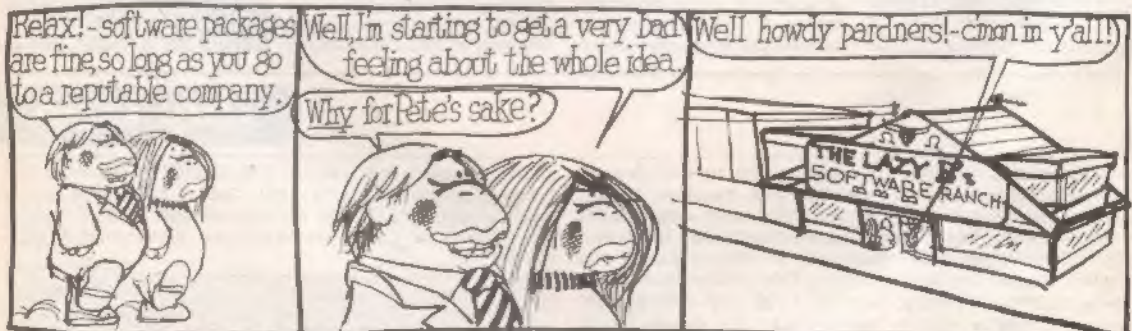
Winner of Puzzle No 135

The winner is J J James of Pant-Yr-Eos, Pontnewydd, Cwmbran, Gwent, who receives £10

Rules

If the puzzle can be sensibly solved using a computer, then the winner will have included a listing of the program used to find the correct answer. The closing date for entries to Puzzle No 140 is January 25.

The Hackers



Cronies and Frogs in Mikro-Gen's Progs....

WITCH'S CAULDRON

SPECTRUM 48K £6.95



Gor blimey,
a hopping good
programme



MIKRO-GEN

44 The Broadway, Bracknell, Berks. 0344 427317

ADVERTISEMENT

MEL AND CHRISTIAN ARE STILL ON THEIR XMAS BREAK...

AUTOMATA'S LOONY MAIL ORDER SALE!



Please send me the following cassettes for my **ZX SPECTRUM 48K**. I understand that I must spend a **MINIMUM OF £10**. No credit card sales with this offer. Orders must be on original coupon. No extra discount for club members. **OFFER ENDS 28th JAN. 1985.**

| | | | | | |
|------------------|--------|-------------|------------|-------|------------|
| DEUS EX MACHINA | RRPE15 | S/Price £10 | GO TO JAIL | RRPE6 | S/Price £2 |
| PIMANIA | RRPE10 | S/Price £2 | PI-BALLED | RRPE6 | S/Price £2 |
| MORRIS/BIKERS | RRPE6 | S/Price £2 | PI-EYED | RRPE6 | S/Price £2 |
| PI-N'ERE | RRPE6 | S/Price £2 | PIROMANIA | RRPE6 | S/Price £2 |
| OLYMPIANIA | RRPE6 | S/Price £2 | CRUSOE | RRPE6 | S/Price £2 |
| NEW WHEELS JOHN? | RRPE5 | S/Price £2 | DARTZ | RRPE5 | S/Price £2 |

I enclose a cheque/postal order/cash payable to AUTOMATA UK for the sum of £

NAME ADDRESS

POSTCODE

Send payment and order to: **AUTOMATA Ltd. 27 Highland Rd. PORTSMOUTH, HANTS. PO4 9DA.**

